MCN Server 8000 ™

Remote Comparator Display Software

for
Motorola Solutions IP Comparators

GCM 8000 Digital Comparator
&
MLC 8000 Analog Comparator

DDN1290

S2-61600-110

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Revision History

S2-61600-105	Release for Production
S2-61600-106	Clarified Local Administrator vs. Active Directory Accounts
S2-61600-107	Added Server ID Selection in HW Setup (for IP comparators) Added information on HIB-IP 8000 units with variable UDP Ports for operation in an Astro™25 7.13 systems and above.
S2-61600-108	Added information about installation and re-installation sequences when used with Windows Hardening Kit and McAfee Anti-Virus for Astro™25 7.13 systems and above. Added information on Default Display Window (Display Screen). Added permissible locations for HIB-IP units in an Astro™ 25 RNI.
S2-61600-109	Changed the IP Networking Considerations section to add PC location restrictions for the Astro™ 25 RNI. Added restriction on Dual-NIC operation in ASTRO®25 RNIs. Added instructions to remove Ethernet cable from HIB-IP unit before configuring it in MCN Config Server software.
S2-61600-110	Updated GCM 8000 BR/CM Pairing screen shot Updated valid network locations for Server and HIB-IPs for A7.13 RNIs Other minor oupdates.

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Introduction

This manual covers the installation, configuration, and operation of the |
MCN Server 8000 and Client Software.

The MCN Server 8000 software can monitor and control the operation of the following types of IP comparators directly through an IP network:

- GCM 8000 — Digital Comparators
- MLC 8000 — Analog Comparators
- Mixed Mode — Mixed Mode Voting Solution
GCM 8000 & MLC 8000 Analog Comparators
working together in Mixed Mode systems

Since the MCN Server 8000 software is an enhanced version of the MCN Advanced Server, it maintains the ability to monitor and control the following types of legacy equipment using components from the MCN Monitoring and Control Network:

- Astrotac 3000 — Digital Comparators
- Digitac — Comparators
- Spectra-TAC — Analog Comparator
- SNV-12 — Voter
- I/O and Alarm devices

The MCN Server 8000 will display receiver status indications such as:

- Vote
- Receive
- Disable
- Fail

It will also enable a user to control the following functions for the receivers

- Force-Vote
- Disable

Manual Structure

Major sections of the manual include

Introduction	General discussion of the MCN Monitoring & Control Network, system requirements for the MCN Server software
Software Installation	Installation of the software
Interfacing to IP Comparators	Covers topics related to the GCM 8000, and ML 8000 comparators and mixed Mode systems
Interfacing to Legacy Equipment	Connecting the MCN Server 8000 to legacy comparators (Astrotac, Digitac, Spectra-TAC) and I/O devices using legacy MCN equipment (HIB-IP or HIB-IP 8000 Modules, CIB, AIB, GPIO Modules)
System Considerations	General system considerations including networking, Windows accounts and file locations & permissions
Configuring a System - McnConfig Server 8000 Program	This is the largest part of the manual, because it describes in detail all the system configuration features and options.
MCN Server 8000 Program	This covers the operation of the MCN Server run-time program.
MCN Client Program	This covers the operation of the MCN Client program.
Windows Event Logging	Description of items logged in Windows Event Log
Advanced Configuration Topics – MCN Config Server 8000	Customizing Display Tables, Master-Sub Comparators, Triggered Output Actions
Appendix A: Error Logging Definitions	Customizing the logging format for screen, disk, and printer logging
Appendix B: Backup & Restore Procedures	Backup & Restore
Appendix C: Installing Legacy PCLTA Interface Board & Driver	Legacy PCLTA Network Interface board installation
Appendix D: Fixing PCLTA Installation Problems	Repairing errors in a PCLTA installation (when installer didn't read the previous section)
Appendix E: Importing a System from MCNRCD for DOS	Converting an old DOS MCN system
Appendix F: Legacy Equipment Part Numbers	Part numbers for MCN equipment to interface to legacy comparators and I/O devices
Glossary	

Shorthand Notation

The manual may refer generically to "MCN Server" or "MCN Server Software" or simply "Server software" to refer to the MCN Server 8000 software.

RCD stands for "Remote Comparator Display".

The manual will refer to other programs in a shorthand notation:

Program	Shorthand	Executable file name
Hardware Setup	HWSetup	Hardware Setup Server.exe
Configuration Program	MCN Config	McnConfig Server 9000.exe
Server Program	MCN Server	MCN Server 8000.exe
Client Program	MCN Client	ClientRcd.exe

This manual may refer to Motorola Solutions, Inc. as simply "Motorola".

Example Screen Captures & Example Data

Example screen captures of the various programs are shown through the manual to give the reader an example of what to expect during setup, configuration, and operation of the software. Newer versions of the software may include updated windows with slightly different wording or additional fields.

Data shown in example screen captures is presented only for example purposes only. It does not reflect any particular user's system.

Various sections of the manual focus on particular topics. Example screen captures within a section are presented as examples of the topics covered in that section. Example data show in the screen captures in one section may not apply to screen captures shown or system configuration described in different sections.

IP Addresses, Subnet Masks, Gateway IP Addresses, UDP port numbers, AGU and VGU IDs shown in the manual are intended to show the appropriate linkages between IP Comparators, AGU Receiver Ports, HIB-IP or HIB-IP 8000 Units, Clients, and Server PCs. They are taken from test systems in a lab and are used as examples only. They will not reflect your system settings. They should not be taken as recommendations.

Since the test system used in preparing this manual did not include the various IP routers used in an ASTRO® 25 7.x system, the example settings do not coincide with the requirements and recommendations of Motorola's IP Plan. Each system is different; refer to the documentation for your system for the proper IP addresses and UDP port numbers.

Example System Diagrams

System diagrams in this manual are included to illustrate example generalized systems and principles and are not intended to reflect any particular system configuration. In particular, a simplified IP infrastructure is shown. Real-world IP networks (especially Astro® 25 Radio Network Infrastructures (RNIs) may include additional routers, gateways, switches, etc.

MCN Server 8000 IP System Example

A typical MCN Server 8000 PC is shown in the figure below attached Motorola IP Comparators. The MCN Server 8000 Remote Comparator Display system consists of:

An PC running the MCN Server 8000™ program

One or more Motorola Solutions IP Comparators (GCM 8000 or MLC 8000)

Client PCs connected to the PC over an IP LAN or WAN.

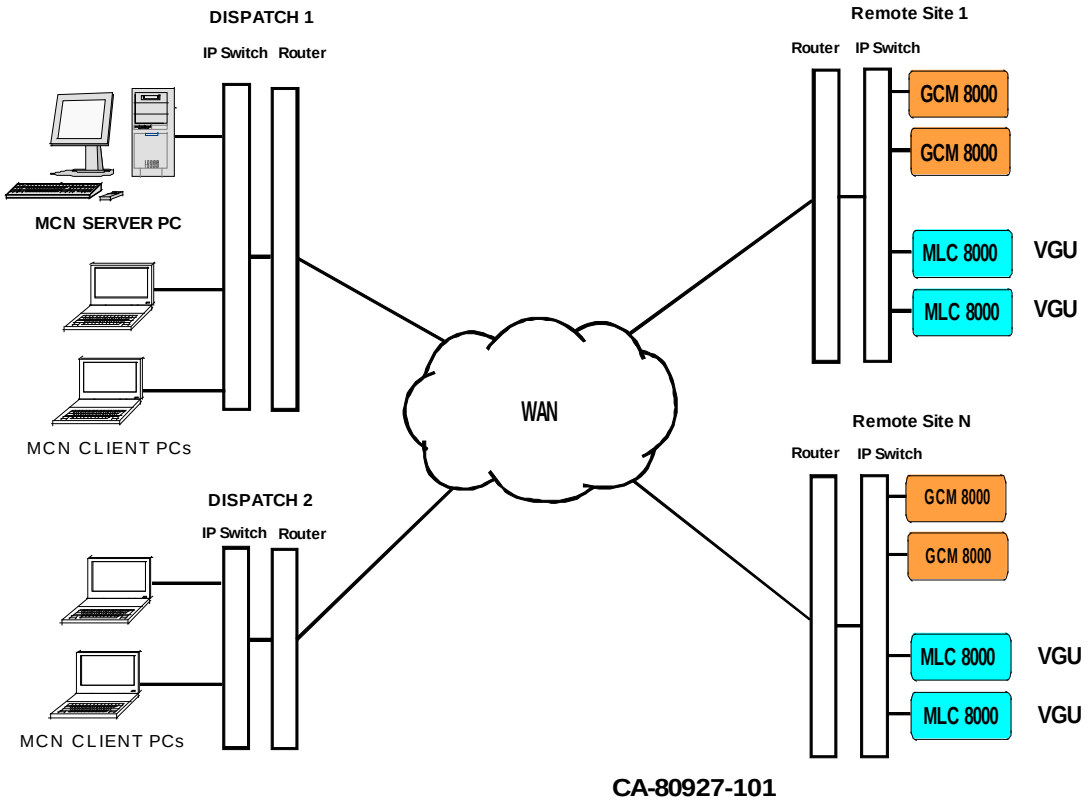


Figure 1 – MCN Server 8000 System with IP Comparators

- The diagram includes only the IP comparators and not legacy equipment.
- The diagram does not show the BRs (Base Radios) or the MLC 8000 Subsite Link Converter (AGU) units.
- Other IP routes and switches may be involved.
- The GCM 8000 and MLC 8000 Analog Comparators can be operating in a stand-alone mode (4 digital and 4 analog channels) or they could be operating as a Mixed Mode Voting Solution (4 Mixed Mode channels) or a combination of stand-alone and Mixed-Mode channels.
- The MCN Server 8000 PC is a stand-alone PC. It does not need Windows Server software.
- Client PCs may be stand-alone PCs or may be MCC 7500 Dispatch PCs running the MCN Client software.

MCN Server 8000 IP and Legacy System Example

The MCN Server 8000 software is an extension of CTI Products' legacy MCN (Monitoring and Control Network) software packages. It retains the ability to support legacy MCN equipment and legacy comparators. For legacy systems, the following optional items may be present:

One or more network interfaces for the MCN Server PC
(such as a HIB-IP OR HIB-IP 8000, internal PCLTA or HIB-232)

One or more Comparator I/O Modules (such as an AIB or CIB)

Other interface modules (such as IOB or GPIO Modules) to drive auxiliary outputs and alarms

The following diagram shows a system that supports both the IP comparators and legacy comparators.

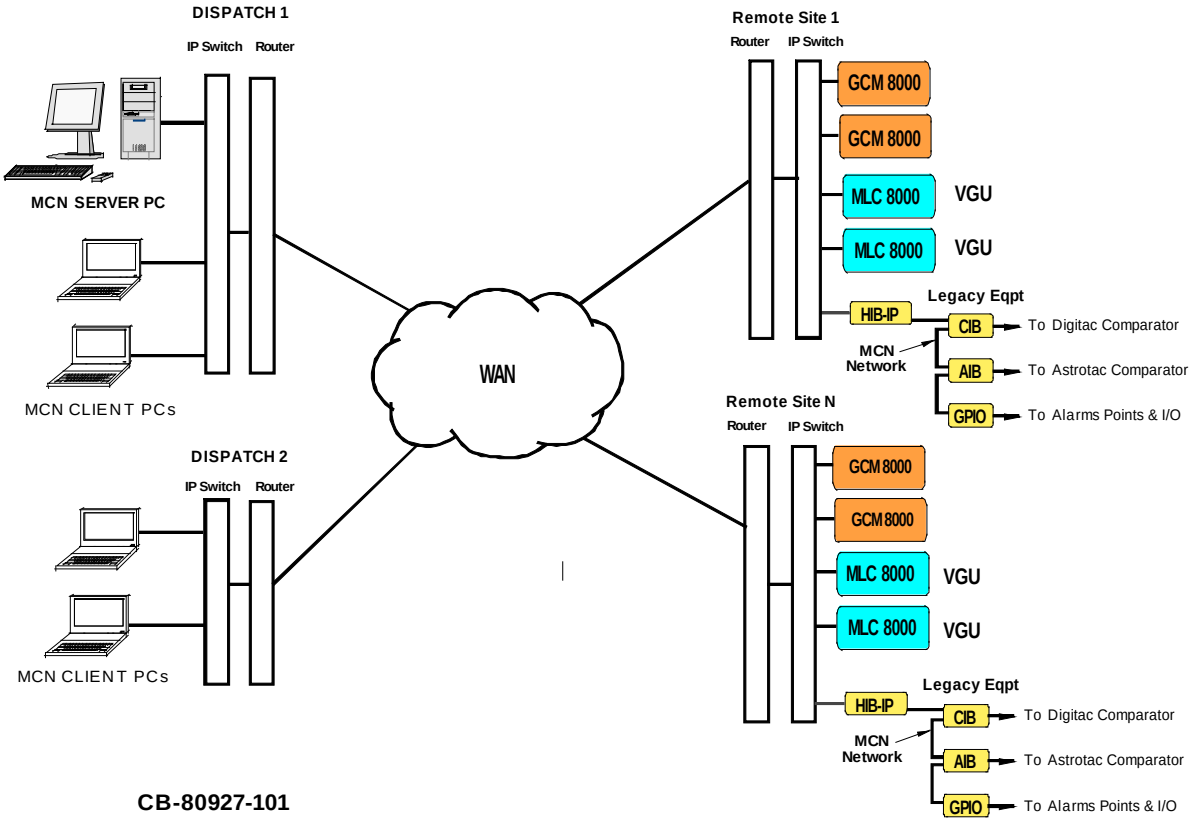


Figure 2 – MCN Server 8000 System with IP & Legacy Comparators

- This diagram shows the addition of MCN modules to support legacy equipment.
- The HIB-IP 8000 units connect to the MCN Network at the remote sites.
- The CIB, AIB, and GPIO Modules connect to the legacy comparators and I/O points.
- The IP comparators and legacy equipment can be displayed on the same screens.

Package Contents

The MCN Server 8000 package will include the following:

Software CD

The MCN Server 8000 software package includes:

Installation Program
This is a standard Installshield program used to install the software on the PCs. The CD has both the MCN Server 8000 and the MCN Client software on it.

HWSetup Program
This is used to select which network Interfaces to use for legacy support. It is also used to enter the Software Key for the system.

MCNConfig Program **(McnConfig Server 8000.exe)**
This is the configuration program that is used by an engineer or technician to build the configuration files when the system is installed or changed.

MCN Server 8000 Program
This is the program that operates on the MCN Server PC. It has a local display that displays the status of the devices on the MCN system (Comparators, I/O points, alarms, etc.). It allows the operator to control receivers (with Force-Vote and Disable functions) and other I/O devices (relays, etc.) from the MCN Server PC.

The MCN Server program also passes the status and control data to MCN Client PCs over an IP LAN or WAN.

MCN Client Program **(ClientRCD.exe)**
This is the Client program that operates on remote PCs to control and display the status of the MCN system. The MCN Client program operates on PCs connected to the MCN Server via an IP network, and thus do not need their own MCN Network Interface.

Manuals in PDF format

Hardware Key

A serialized USB Key is included.

Software Key CD

This CD will have the Software Key for the system. The Software Key matches the serial number of the Hardware Key. It will contain the capabilities licensed for the software (number of IP comparators, number of clients, etc.)

Software Manual

This manual.

No PCs Included

The MCN Server 8000 software package does not include Server or Client PCs.

Reference Documents

Manuals for Motorola Solutions, Inc. Equipment

Information on the Motorola IP Comparators can be found in the documents available from Motorola Solutions for your system. The following is a list of manuals that may apply to your system. There may be additional manuals that may apply. Be sure to use the proper version of the manual for your system's version.

GCM 8000 Comparator Manual

MLC 8000 Comparator Manual

Quick Guide for Implementing MLC 8000s

MLC 8000 Configuration Tool with Analog Display and Control manual

Conventional Operations manual

GTR 8000 Base Radio Manual

Information Assurance Features Overview manual

MCC 7500 Dispatch Console with VPM manual

System LAN Switches manual

System Gateways – GGM 8000 manual

Authentication Services

Windows® Supplemental CD and the corresponding ASTRO 25 system Windows Supplemental Configuration manual

Manuals for Legacy CTI Products MCN Equipment

Details of other legacy hardware components of the system can be found in the following documents:

S2-60425	Monitoring and Control Network, System Manual
S2-61173	HIB-IP & HIB-IP 8000 Remote Network Interface Hardware Reference Manual
S2-60427	HIB-232 Host Computer Interface Module, Hardware Reference Manual
S2-60426	CIB Comparator I/O Module, Hardware Reference Manual
S2-60399	AIB Astrotac Comparator Interface Module, Hardware Reference Manual
S2-60630	IOB I/O Control Module, Hardware Reference Manual
S2-60596	EXB-232 and EXB-IM Network Extender Modules, Hardware Reference Manual
S2-61089	EXB-IP and EXB-FI Network Extender Modules, Hardware Reference Manual
S2-60649	MCN Router Modules, Hardware Reference Manual

MCN Server 8000 Part Numbers

The following part numbers are for the MCN Server 8000 software and options.
Legacy MCN equipment part numbers appear in the ***Appendix F: Legacy Equipment Part Numbers*** section on page ***224***.

Motorola Part Number	CTI Products Part Number	Description
DDN1289	S1-61594	MCN SERVER 8000 SW LIC FOR 4 MOTOROLA IP COMPARTORS & 4 CLIENTS
DDN1287	S1-61595	MCN SERVER 8000 SW LIC OPT FOR 1 ADD'L MOTOROLA GCM 8000 OR MLC 8000
DDN1288	S1-61596	MCN SERVER 8000 SW LIC OPT FOR 4 ADD'L MOTOROLA GCM 8000 OR MLC 8000
DDN1295	S1-61129	MCN SW LIC OPT CLIENT EXPANSION FOR 4 ADD'L CLIENTS
DQS261151	S2-61151	MCN HIB-IP 8000 UNIT FOR LEGACY MCN NETWORKS
DDN1294	S2-61164	MCN SW LIC OPTION MULTI-NI-4. ADDS SUPPORT FOR (4) HIB-IP (or HIB-IP 8000) Units
DDN1290	S2-61600	MCN SERVER 8000 MANUAL

Hardware and Software Environments

MCN Server 8000 and Client software requires a PC with the following minimum system configuration:

Windows XP, Vista, or 7 or Windows Server 2003, 2005, 2008R2
The MCN Server software does not need to be run on a Windows Server operating system.

Intel 64-Bit processor 2.0 GHz (Xeon Dual-Core W3503 recommended)

2 GB Memory

CD-ROM Drive

Open USB 2.0 Port

100Base-T Ethernet port

One open serial port if the local network interface is a HIB-232

One open PCI slot if a legacy MCN PCLTA Network Interface card is used (only for 32-bit operating systems)

Color Monitor

Supported Operating Systems

In a stand-alone system, the MCN Server software and the Client software can run on:

- Windows XP
- Windows Vista
- Windows 7
- Windows Server 2003
- Windows Server 2005
- Windows Server 2008r2

Recommended Software

It is recommended that Adobe Acrobat Reader be installed on the system to provide access to the manuals in PDF format from Windows and from the Help menu.

ASTRO® 25 7.12 & 7.13 Certification

The software is certified for use in an ASTRO® 25 Ver 7.12 & 7.13 system for the following operating systems:

- Windows 7, 64 Bit

Follow all of Motorola's Networking, Information Assurance, Hardening and other system requirements and recommendations for use on ASTRO® 25 7.12 & 7.13 systems.

NM Client & MCC 7500 Console Cohabitation

The Client software is certified to be installed and co-habit with NM Clients or MCC 7500 consoles. It can also be installed on a stand-alone PC.

Security and Information Assurance Recommendations

Review these recommendations before installation and follow them during installation and operation:

1. Software Installation Locations
   Install the software in default program directory recommended by Install-shield.
2. Configure the MCN Server 8000 and MCN Client software as described in this manual. If applicable, take into consideration commercially accepted practices, industry standards and the standards for your organization.
3. Do not save user files or system configuration files in the program directory.
4. Save system configuration files to a directory that requires Administrator rights so that users cannot delete or edit the configuration files. See the Windows Accounts section on page ***61*** for additional information.
5. Always run the software with the lowest permission set possible.
   Run both the MCN Server 8000 and the MCN Client software with User rights, not Administrator rights. See the Windows Accounts section on page ***61*** for additional information. (Note: To initially configure the MCN Server List or change the MCN Server List for the MCN Client software, you will need to run MCN Client with Administrator rights once. For subsequent operation, run it with User rights.)
6. When configuring a system, do not enter Sensitive or Confidential information into the system configuration files.
7. The MCN Server 8000 software, the MCN Client software and system configuration files are not backed up as part of the ASTRO® 25 Back UP & Restore (BAR) solution. Follow the Backup & Recovery procedures as listed in Appendix B: Backup & Restore Procedures on page ***205*** for the MCN Server 8000, MCN Client, and system configuration data. The procedures in the Appendix apply only to this software and do not back up or restore part of the ASTRO® 25 system.
8. Follow the applicable Backup & Recovery procedures for your system, PCs, and operating systems as defined by your organization, the hardware and software vendors, and commercially acceptable practices.
9. Limit access to PCs
10. Limit access to networks, both physically and through appropriate restrictions in routers and switches
11. Use strong passwords

12. Follow Motorola's and your organization's recommendations on security and Information Assurance.
13. Use the appropriate Windows Hardening Kits for your installation
14. Use anti-virus and anti-malware packages
15. Install appropriate security patches for installed software and operating system
16. The MCN Server is not a syslog client. Event logging is done locally to the MCN Server. See Windows Event Logging and Appendix A: Error Logging Definitions sections for details.
17. The Back up & Restore (BAR) procedures in this manual are for the MCN Server 8000 system.
18. Use of multiple NIC cards (Dual-Home systems) is not approved by MSI in ASTRO® 25 RNIs due to Information Assurance (IA) security concerns.

Local Administrator versus Active Directory Accounts

Some of the operations described in this manual require Administrator rights.

Log on either as the local Windows administrator, or using your Active Directory account that is a member of the group "cti-login" with authority to access this device. The local Windows administrator account set up by Motorola for Windows 7-based devices is "secmoto".

NOTE: Active Directory account login is recommended, if available.

Legacy Network Interfaces & Drivers

Three general categories of MCN Network Interfaces are used with MCN Server program to support legacy MCN systems:

HIB-IP External Modules	For connection to MCN 78K networks over IP networks Legacy Units: Version 110 - 399 The Legacy HIB-IP unit(s) can be local or remote. Legacy units are not certified for use across Astro™25 RNIs. HIB-IP 8000 Version 400 & higher: These versions are for use across Astro™25 RNIs.
HIB-232 External Modules	Version 200 & Up 78K (with Rotary address switches on back) For RS-232 connection (Although the HIB-232 manual talks about dial-up operation, the MCN Server 8000 program does not support dial-up operation of the HIB-232.)
Internal Boards PCLTA-21	Half-Size PCI Board 78K or 1250K versions For direct connection to the MCN Network ***Supported only by 32-bit operating systems.*** (Also supports connection to remote networks using EXB Network Extender Modules)

Legacy Drivers for MCN Server

- The PCLTA Interface boards need a software driver to run the MCN Server program. This will be included with the PCLTA & software package. This drive is only available for 32-bit operating systems.
- The HIB-IP and HIB-232 modules do not need a driver for normal operation of the MCN Server program.

Software Installation

Installation in Motorola Solutions, Inc. Astro™25 Systems

PCs installed in a Motorola Solutions, Inc. (MSI) Astro™25 system must have (among other things) the following items installed:

- Windows Hardening Kit
- Anti-Virus (For Astro™ 7.13 and above systems, the anti-virus system used is: McAfee EndPoint Software

The proper order for software installation is:

1. Install the Windows Operating System (if not re-installed).
   See instructions in appropriate MSI document.
2. Perform the Operating System Initialization Steps.
   See instructions in appropriate MSI document.
3. Install the Motorola Solutions Inc. Windows Hardening Kit.
   See instructions in appropriate MSI document.
4. Install MOTOPATCH.
5. Install the MCN Server 8000 and/or Client software as described in the following sections of this manual.
6. Install the McAfee EndPoint Software.
   See instructions in appropriate MSI document.

Re-Installation of in Motorola Solutions, Inc. Astro™25 Systems

If you need to re-install the software or an update, the proper order for is:

1. Normally, you should be able to re-install the software without un-installing McAfee Endpoint Software or disabling functions in it. However, that might change with different configurations. If you have difficulty installing the CTI software, try turning off the virus protection. If that fails, try un-installing McAfee.
2. Remove the CTI software
3. Install the MCN Server 8000 and/or Client software as described in the following sections of this manual.
4. Re-enable or re-install McAfee Endpoint Software if it was disabled or removed in an earlier step.

Installation Overview

Prior to installation, please read the ***System Considerations*** section of this manual starting on page 60.

The installation of the MCN Server software and network interfaces are done in the following order:

If you have legacy MCN equipment and will use a PCLTA network interface (32-bit Windows only), install the PCLTA device drivers and network interface card, then test the interface. See ***Appendix C: Installing Legacy PCLTA Interface Board & Driver*** on Page ***210***.

1) Run setup.exe on the MCN Server PC to install the MCN Server software. . See ***Installing MCN Server Software*** on page ***22***.

2) Gather the information on your system.
For IP comparators, see Interfacing to IP Comparators on page ***41***
For systems with Legacy Comparators or I/O devices, see Interfacing to Legacy Equipment on page ***59***.

3) Run the MCN Config Server program (see page ***41***.) to build your system resources lists for:

   Network Interfaces (Legacy systems)
   Legacy: PCLTA, HIB-IP, HIB-IP 8000, HIB-232

   Hardware Modules (IP & Legacy):
   IP: GCM 8000, MLC 8000, Mixed Mode
   Legacy: CIB, AIB, GPIO

   Channel Names

   Receiver Names, I/O Points & other data.

   You will probably **not** need to edit the Display Tables unless you need to change the display colors and text for the receiver status displays.

4) Use MCN Config Server program to build your **Display Screen(s)** by:
   Placing receivers & I/O points on screens

   Adding channel labels

   Adding tabs if required

5) Use MCN Config Server program to build a list of **Client Authorizations** if required to limit access of certain clients to certain display screens

6) If you have Legacy MCN equipment and are using HIB-IP or HIB-IP 8000 units, program them using MCNConfig program. See ***Programming HIB-IP and*** HIB-IP 8000 Units *on* page ***86***.

7) Install the Security Hardware Key in a USB slot on the MCN Server PC.

8) Run the MCN Server program on the MCN Server PC. See ***MCN Server 8000 Program*** on page ***125***. You will be asked to enter the MCN Software Key and IP parameters on the first use.

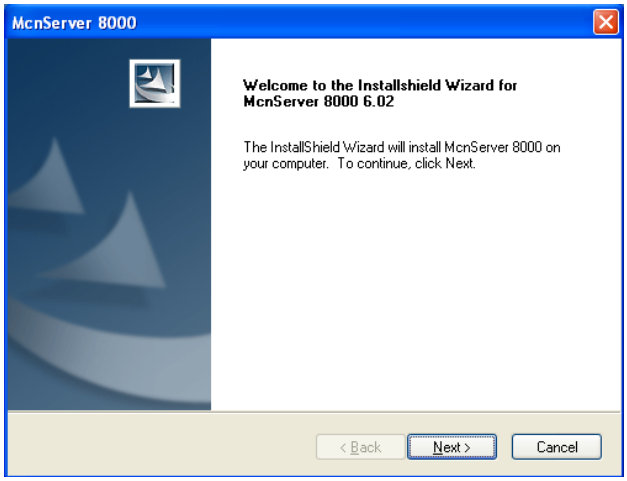
9) Run setup.exe on the MCN Client PCs to install the MCN Client program. See ***Installing MCN Client*** on page ***37*** for details.

10) Run the MCN Client program on the Client PC(s). See ***MCN Client Program*** on page ***142***.

Installing MCN Server Software

Run Setup.exe from the CD.

You must have Administrator rights to install the MCN Server software.

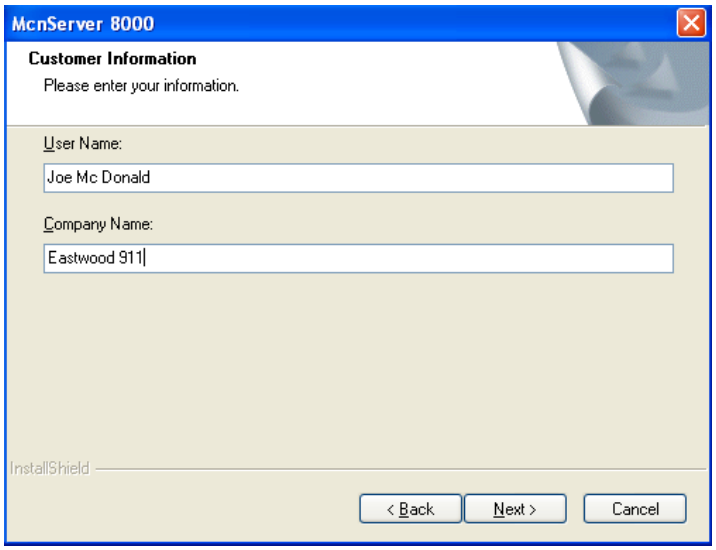

McnServer 8000
Welcome to the Installshield Wizard for McnServer 8000 6.02
The InstallShield Wizard will install McnServer 8000 on your computer. To continue, click Next.
< Back
Next >
Cancel

McnServer 8000
License Agreement
Please read the following license agreement carefully.
MCN Server 8000™ & Client Software License Agreement
NOTICE
This is a legal agreement between You and CTI Products, Inc. ("CTI"). YOU MUST READ AND AGREE TO THE TERMS OF THIS SOFTWARE LICENSE AGREEMENT BEFORE
I accept the terms of the license agreement
I do not accept the terms of the license agreement
Print
InstallShield
< Back
Next >
Cancel

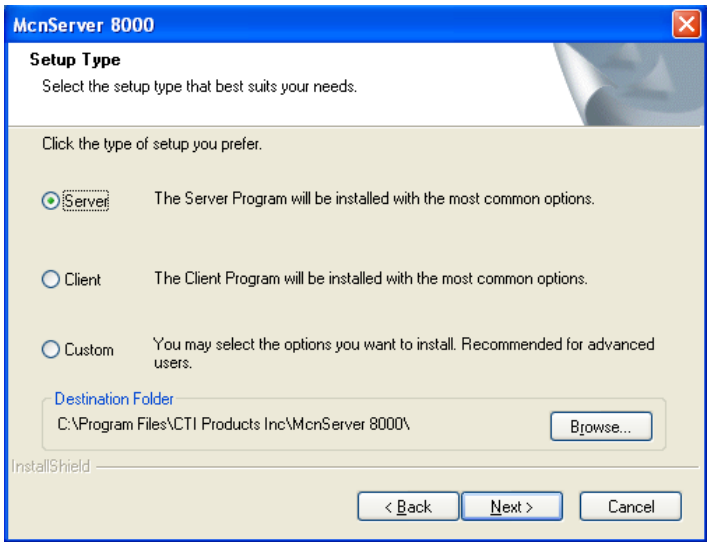
Read the License Agreement.

If you agree to the terms, click the "I Accept…" button as shown above and then hit the Next button to continue toe installation.

Customer Information Window



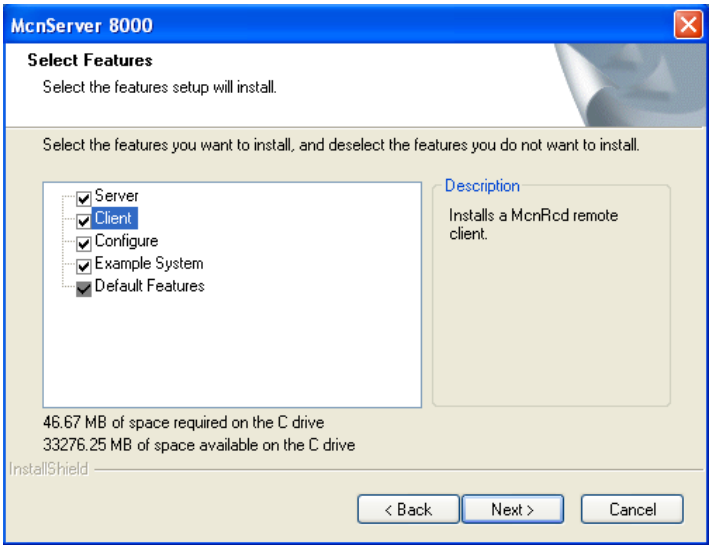
Selecting the type of installation


McnServer 8000
Setup Type
Select the setup type that best suits your needs.
Click the type of setup you prefer.
Server
The Server Program will be installed with the most common options.
Client
The Client Program will be installed with the most common options.
Custom
You may select the options you want to install. Recommended for advanced users.
Destination Folder
C:\Program Files\CTI Products Inc\McnServer 8000\
Browse...
InstallShield
< Back
Next >
Cancel

If you choose the custom installation, you can install both the MCN Server and the MCN Client programs on your PC.

Custom Installation

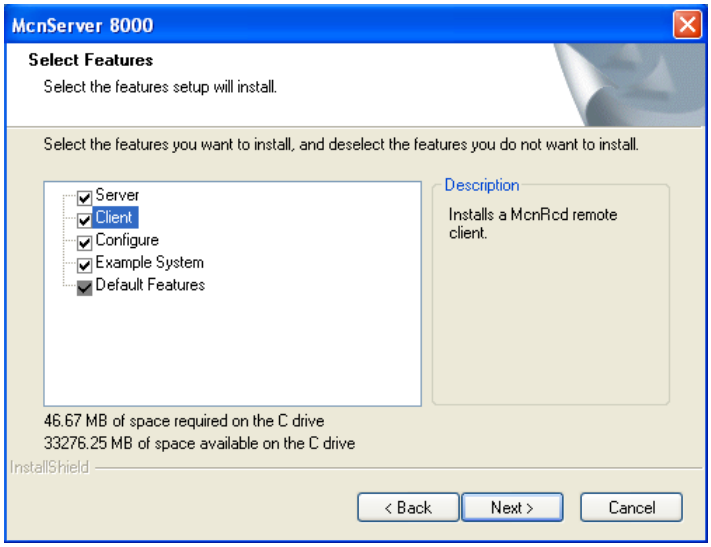
If the "Custom" option is shown, the following window is displayed.
(If the "Custom" option is not chosen, this step is skipped.)


McnServer 8000
Select Features
Select the features setup will install.
Select the features you want to install, and deselect the features you do not want to install.
Server
Client
Configure
Example System
Default Features
Description
Installs a McnRcd remote client.
46.67 MB of space required on the C drive
33276.25 MB of space available on the C drive
InstallShield
< Back
Next >
Cancel

You can install the Client software on the Server PC.

After selecting the desired options, select Next.

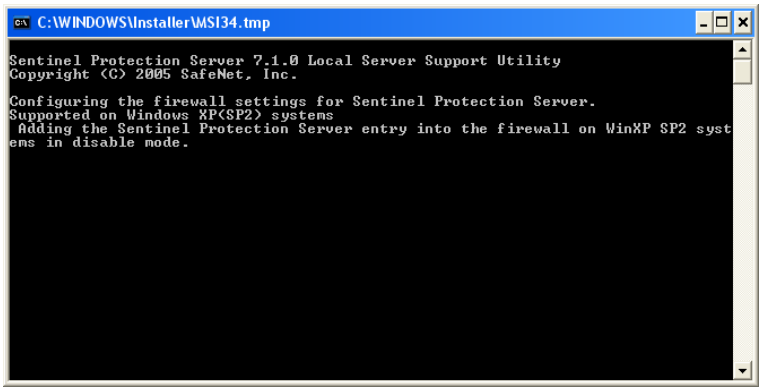
File Copying


McnServer 8000
Select Features
Select the features setup will install.
Select the features you want to install, and deselect the features you do not want to install.
Server
Client
Configure
Example System
Default Features
Description
Installs a McnRcd remote client.
46.67 MB of space required on the C drive
33276.25 MB of space available on the C drive
InstallShield
< Back
Next >
Cancel

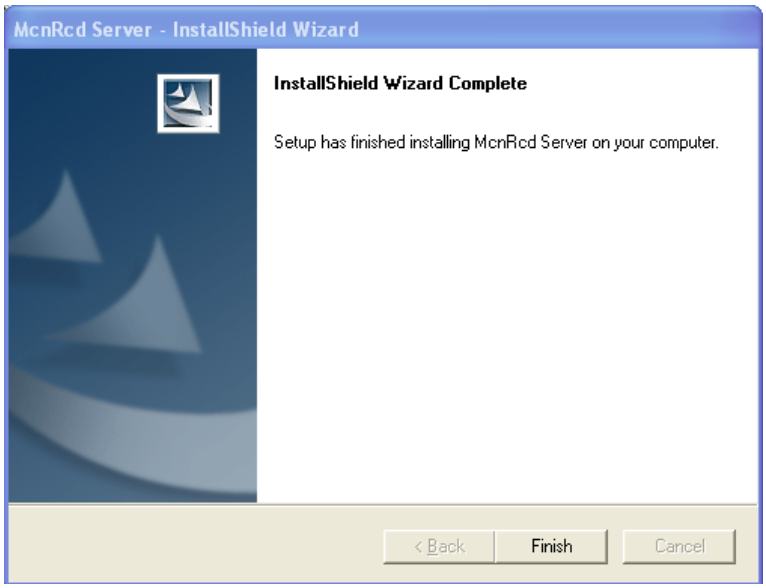
Confirm the settings and hit Next.

Hardware Key Driver Installation

The driver software for the Hardware Key will be installed automatically.
The process may be so quick that you don't even see the installation process.


C:\WINDOWS\Installer\MSI34.tmp
Sentinel Protection Server 7.1.0 Local Server Support Utility
Copyright (C) 2005 SafeNet, Inc.
Configuring the firewall settings for Sentinel Protection Server.
Supported on Windows XP(SP2) systems
Adding the Sentinel Protection Server entry into the firewall on WinXP SP2 systems in disable mode.

Completing the Installation



Click Finish.

Remove the CD.

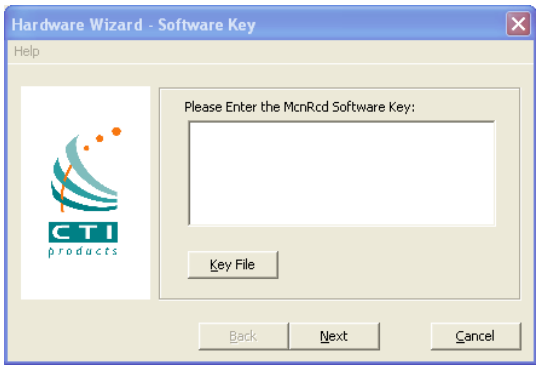
This finished the software installation.

Hardware Setup – HWSetup.exe

The Hardware Setup program is used to enter the Software Key and inform the programs which types of Network Interfaces (IP Comparators, HIB-IP units, or Non-Dial-up HIB-232 units) will be used in the system.

Software Key

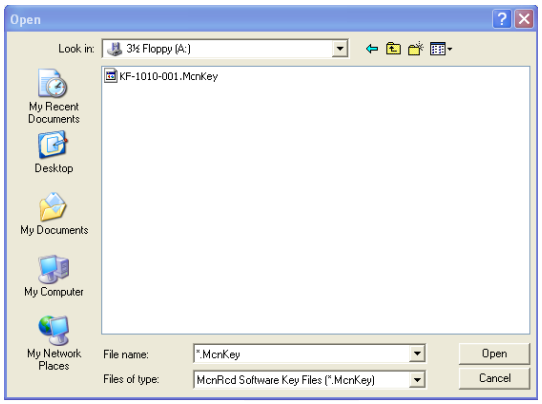
You will be asked to enter your software key.



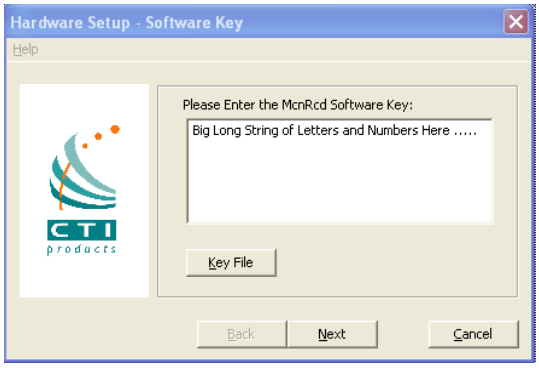
You can type it in if you want to, but it's easier to hit the Key File button and find your key file.

Your software key file will be included on a custom diskette or CD for your system.

Insert the Software Key CD in the CD Drive.



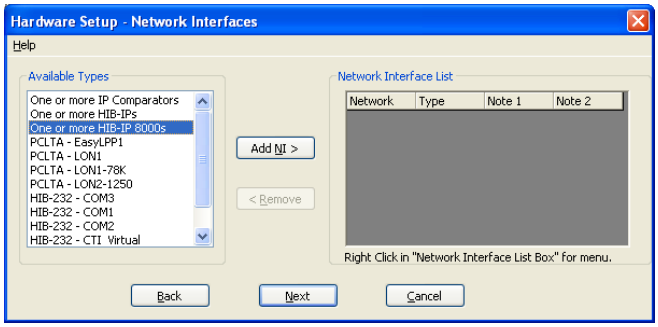
Navigate to find the software key file and click **Open.**



The Software Key will be entered. Click the **Next** key.

HW Setup - Network Interface Setup

The first time HW Setup is ran, it sees that there is no Network Interface defined on the PC. It will ask you what type of Network Interface (NI) you plan to use.



(The number of options in the "Available Types" list will vary by system.
Most systems will not show the PCLTA, LPP or virtual serial port entries.)

Select the type of Network Interface you intend on using with your system, from the list of possible types available. Wee the indicated manual sections for further instructions:

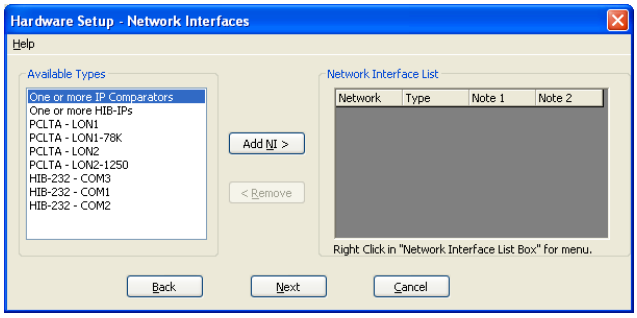
Network Interface Type	**Description**
IP Comparator(s)	Choose this if you have one or more of the following Motorola Solutions comparators: GCM 8000 or MLC 8000 (either stand-alone or in a Mixed Mode configuration) See the **HW Setup – IP Comparator Network Interface** section on page **30** for details (Also see Note 1 below.)
HIB-IP(s) and HIB-IP 8000(s)	Legacy Remote Network Interface that connects to the PC through an IP channel See the **HW Setup – HIB-IP Legacy Network Interface** section on page **30** for details. (Also see Note 1 below.)
HIB-232 – COMx	Legacy non-dial-up HIB-232 units - HIB-232 units connect to a COM port directly or through external leased-line modems or equivalent. See ***HW Setup – Legacy HIB-232 (non dial-up)*** section on page 31 for details.
PCLTA	Legacy internal board in the PC. (32-Bit Windows only). The MCN network will connect directly to this board. If there is a PCLTA board that is properly installed, the HW Setup program will list it in the "Possible Types" list. See: **HW Setup - Legacy PCLTA Setup – 32 Bit Windows only** on page 33 for details.

Note 1: You will need to set up parameters for the IP Comparators and/or HIB-IP units in the system configuration files by using McnConfig Server program. You will also have to download settings to the HIB-IP from the McnConfig Server program.

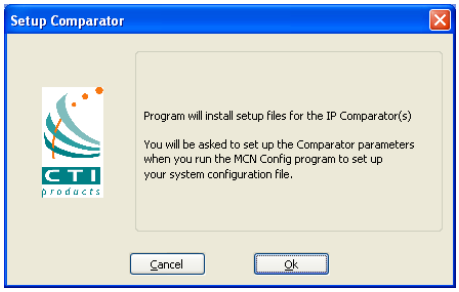
After you have selected the proper Network Interfaces for your system, go to the **Miscellaneous Installation Considerations** section on Page 35.

HW Setup – IP Comparator Network Interface

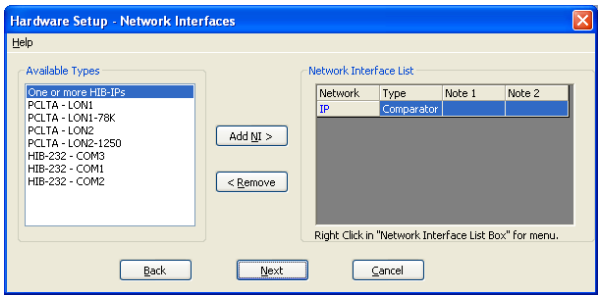
If you will be using one or more IP Comparators, select it from the Possible Types list.



- Select the One or more IP Comparators option.
- Click the Add NI button.


Setup Comparator
Program will install setup files for the IP Comparator(s)
You will be asked to set up the Comparator parameters when you run the MCN Config program to set up your system configuration file.
Cancel
Ok

- Click the OK button.



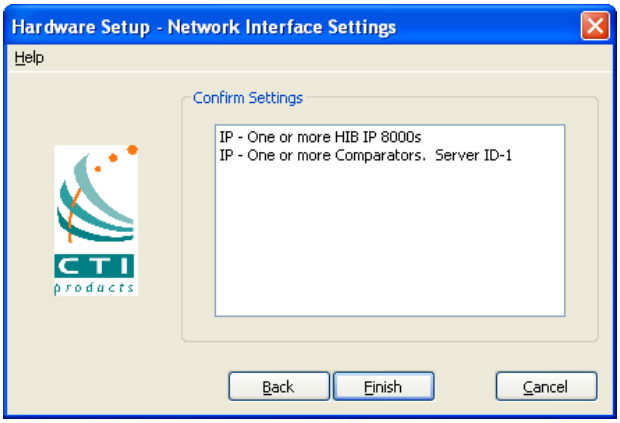
"Comparator" will appear in the Network Interface List.

- If you need to add additional Network Interfaces, do so at this time.
- Click the Next button
- **MCN Sever ID:**
  If you have selected IP Comparators, the following window will appear:

Setup Comparator
MCN Server Id:
1
The Program will install setup files for the IP Comparator(s)
You will be asked to set up the Comparator parameters when you run the MCN Config program to set up your system configuration file.
Cancel
Ok

  Normally, select MCN Server ID 1.
  If you have multiple MCN Server 8000 PCs, number them sequentially.

- A synopsis will be presented:

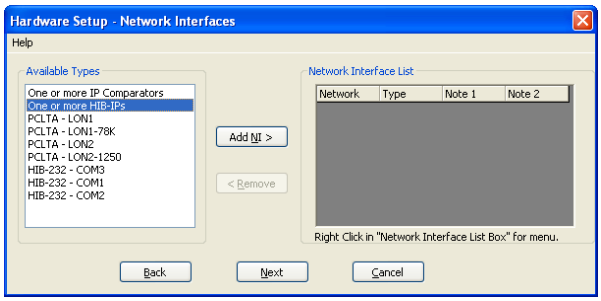


- Click the Finish button.

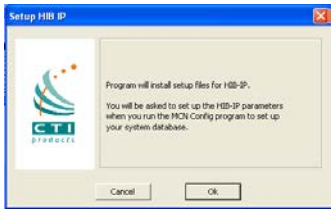
After you have selected the proper Network Interfaces for your system, go to the Miscellaneous Installation Considerations section on Page 35.

HW Setup – HIB-IP Legacy Network Interface

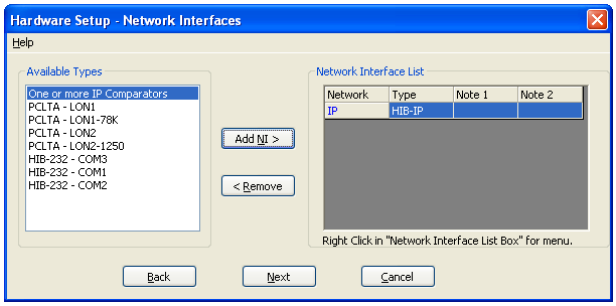
If you will be using one or more HIB-IP units to connect to a legacy MCN system, select it from the Possible Types list.



- Select the HIB-IP option.
- Click the Add NI button.

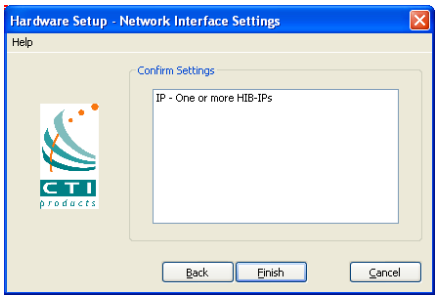

Setup HIB IP
Program will install setup files for HIB-IP.
You will be asked to set up the HIB-IP parameters when you run the MCN Config program to set up your system database.
Cancel
Ok

- Click the OK button.



"HIB-IP" will appear in the Network Interface List.

- If you need to add additional Network Interfaces, do so at this time.
- Click the Next button



- Click the Finish button.

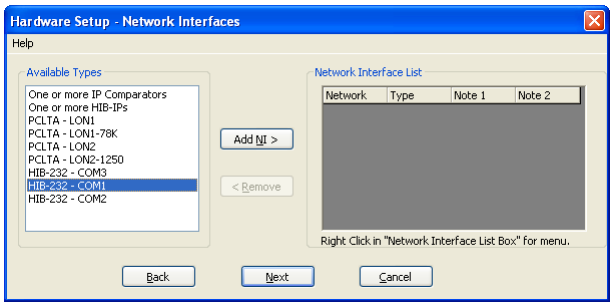
After you have selected the proper Network Interfaces for your system, go to the Miscellaneous Installation Considerations section on Page 35.

HIB-IP Parameters

As shown in the "**Setup HIB-IP**" window above, you will later enter the HIB-IP parameters in the system configuration files using the McnConfig program. You will also have to download those parameters to the HIB-IP using McnConfig.

HW Setup – Legacy HIB-232 (non dial-up)

If you have a HIB-232 module (and are using it directly connected or through leased line modems) select the proper COM port from the **Available Types** list box:



The program detects all COM ports reported by Windows.
Depending on your PC, not all ports may be available for use.

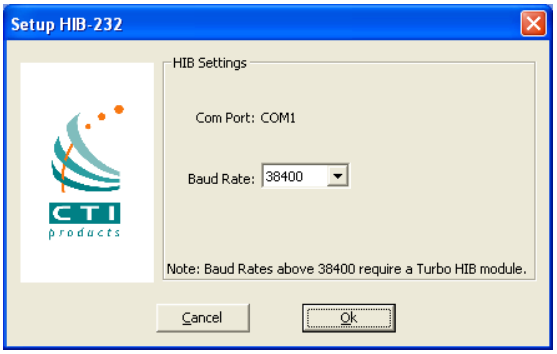
* Some COM ports may not be brought out to a connector.
* Some COM ports may be reserved by an internal modem.
  (For example, in the snapshot above, COM3 is actually an internal modem.)

USB to Serial Adapters

The MCN Server program will work with some USB to Serial adapters. We cannot guarantee that it will work with all such adapters since we cannot test all brands.

Some USB to Serial adapters will change their COM port number when they are plugged into a different USB connector. If you are using one of these and you change its connection, you will have to re-run the HW Setup program to select the new COM port.

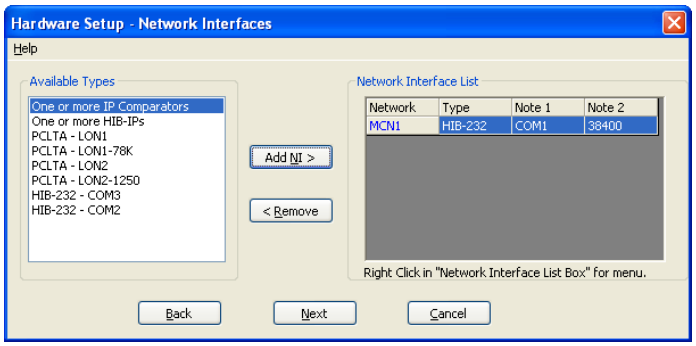
- Select the proper COM Port and Click the Add NI button



- Select the appropriate baud rate. Be sure that the baud rate matches the Baud rate switches on the HIB-232 module.

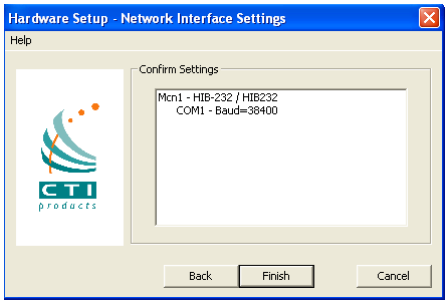
  (The Group and Module addresses for the HIB-232 unit are set with rotary switches on the unit. See ***Important: MCN Address Setting*** on Page ***33*** for more information on MCN addressing.)

- Click the OK button.



The HIB-232 unit will appear in the Network Interface List.

- If you need to add additional Network Interfaces, do so at this time.
- Click the Next button



- Click the Finish button.

The HW Setup program will save the setting in the registry.

This setting will be used by the MCN Server program.

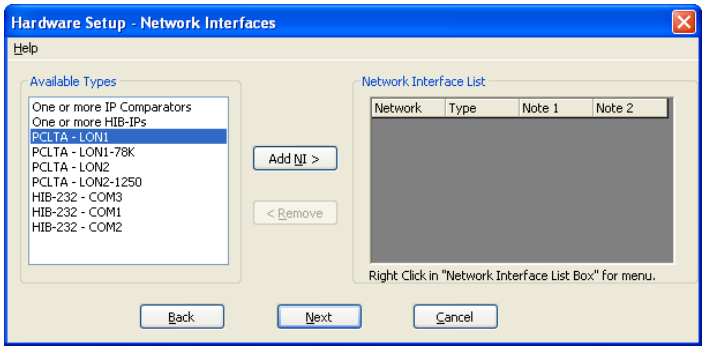
After you have selected the proper Network Interfaces for your system, go to the Miscellaneous Installation Considerations section on Page 35.

HW Setup - Legacy PCLTA Setup – 32 Bit Windows only

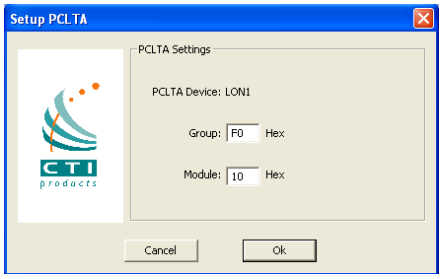
If a PCLTA Card (and its driver) are properly installed on your PC, the HW Setup program will detect it and present it in the *Possible Types* list box.

You can check to see if the PCLTA card is installed and operational, by going to Control Panel and running the Lonworks application. You may then click on the Diagnostics tab and look for a response box without error indications, if the installation was done correctly.

Note: There are no PCLTA drivers available for 64 Bit Operating Systems.



- Select the PCLTA and click the *Add NI* button.



The Group/Module address defaults to “F0/10” during installation.

- Change the Group and Module address as required for your system.
- Click the OK button.

Some complex systems may use MCN Advanced Server with multiple PCLTAs. These steps will need to be repeated for each PCLTA.

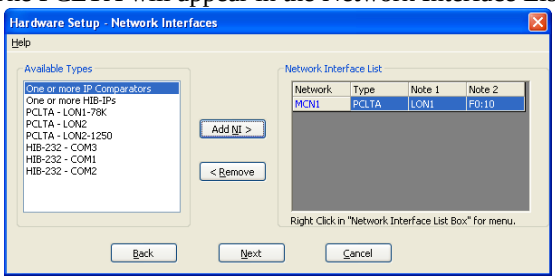
Important: MCN Address Setting

Each PC and each MCN module in the system must have a unique address. If you are setting up multiple PCs, be sure to set up each PCLTA card with its own address. Typically, PCLTA cards are addressed in Group F0 starting at Module 10.

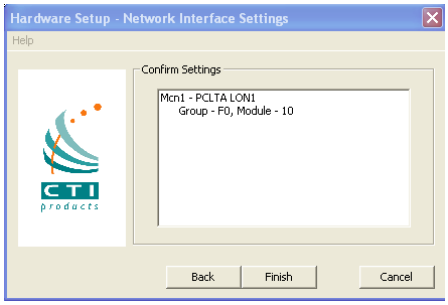
If you have a Custom Engineered System (with custom system documentation part number KA-8xxxx-xxx), be sure to set the PCLTA address to the Group & Module numbers shown in your documentation. Failure to do so may cause the system not to work

- In the above window, click the **OK** button.

The PCLTA will appear in the Network Interface List:



- If you need to add additional Network Interfaces, do so at this time.
- Click the Next button.



- Click the Finish button in the confirmation window.

The appropriate information for the PCLTA is now stored in the registry and will be available for use by McnConfig and MCN Server programs.

The MCN Group and Module addresses are set up on hex rotary switches on the back of the HIB-232 unit.

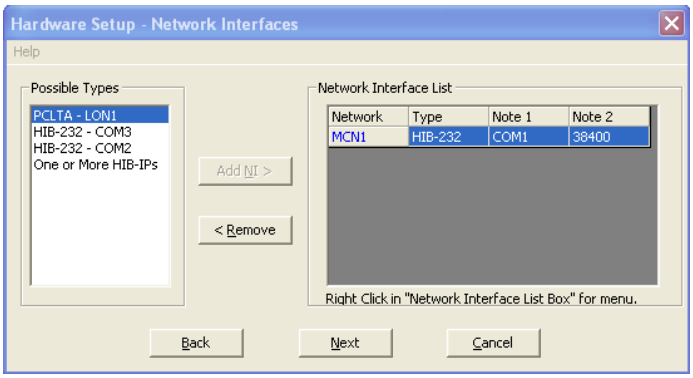
After you have selected the proper Network Interfaces for your system, go to the Miscellaneous Installation Considerations section on Page 35.

Miscellaneous Installation Considerations

Changing Settings for your Legacy Network Interface

If you need to change the settings for your Network interface, re-run the HWSetup program. This program can be used to change the:

- Type of Network Interface
- PCLTA Device or Group & Module address
- HIB-232 COM Port or Baud Rate



To change these items you can either:

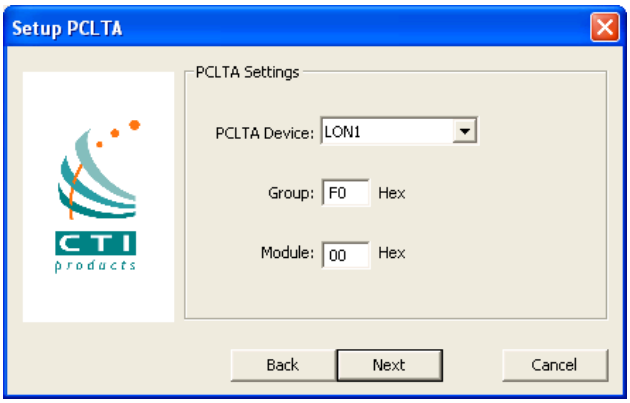
- Double click on the Network Interface to edit its parameters or
- Click the Remove button to remove the Network Interface and select a different one.

If you have a Custom Engineered System (with custom system documentation part number KA-8xxxx-xxx), be sure to set the PCLTA address to the Group & Module numbers shown in your documentation. Failure to do so may cause the system not to work

In the above window, click the **Next** button,

Changing the PCLTA Group/Module Address

If the Group/Module address for the PCLTA Network Interface needs to be changed (or to query the PCLTA for its current address), simply run the ***hwsetup.exe*** program. This program can be found in the main program directory (typically c:\Program Files\CTI Products Inc\McnRcd Server 8000). Then click the **Next** button until the following window is displayed.



The Group/Module address defaults to "F0/00" during installation. However, each PC must have a unique address.

In the above window, click the **Next** button, then the **Finish** button to complete the address change for the PCLTA Network Interface.

PC Power Options Setup

The "Power Options" icon in the Control Panel allows for a wide variety of PC operation parameters. However, installation of MCN Server software will disable any possibility of the PC going into the Standby or Hibernate Mode.

The monitor may be allowed to "sleep" as long as the "Monitor Timeout" is less than the "Standby Time". Otherwise, the monitor will never sleep.

Printer Installation

For printer logging to occur, a printer must be installed from the Windows operating system. From the **Start** menu button on the windows desktop, select "Printers and Faxes" from the list, then select "Add a Printer" from the list of "Printer Tasks".

Uninstalling MCN Server Software

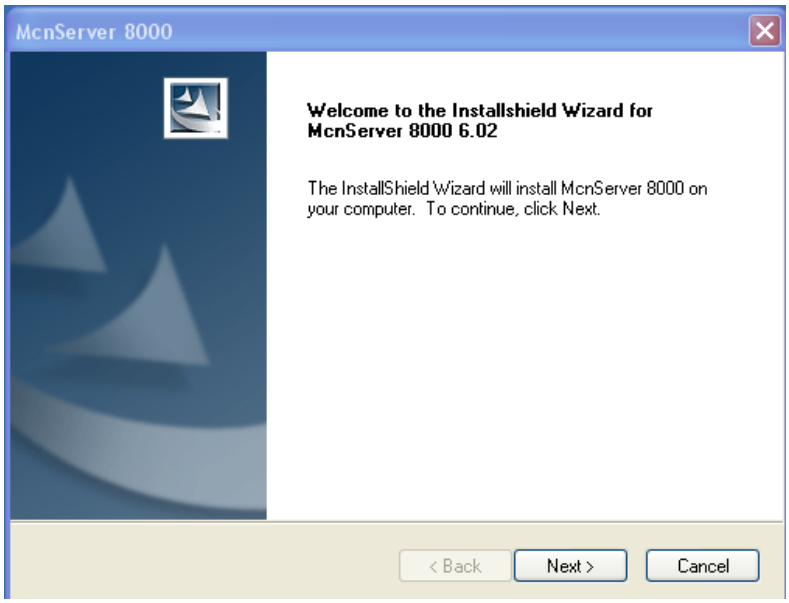
To uninstall MCN Server software, insert the MCN Server distribution CD into the CDROM drive. Click the **Start** menu button on the Windows desktop, then select "Run …" from the list. In the "Run" dialog box, type ***d:setup.exe*** (where d is the drive letter of the CDROM drive), then click the **OK** button. In the "InstallShield Wizard" window, select "Remove", then click the **Next** button. Follow the prompts until the InstallShield Wizard completes the removal.

Installing MCN Client Program

You would normally install the MCN Client program on a separate PC from the MCN Server, but you can also install a copy on the MCN Server PC.

You must have Administrator rights to install the MCN Client program.

The installation steps are shown below.

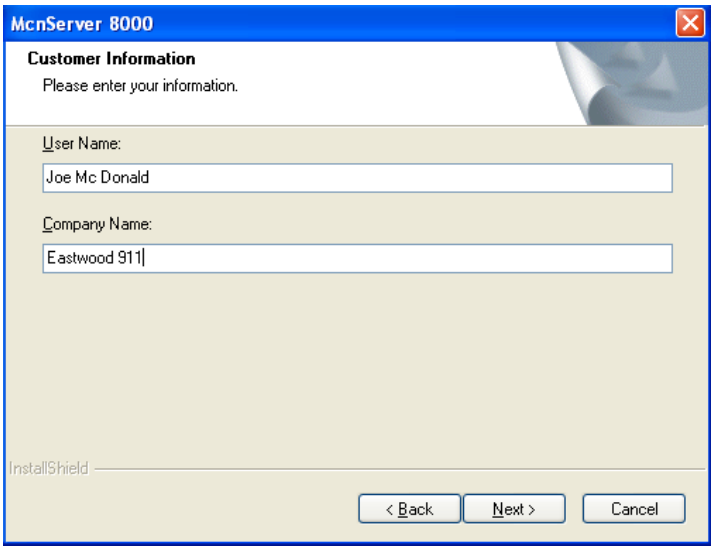

McnServer 8000
Welcome to the Installshield Wizard for McnServer 8000 6.02
The InstallShield Wizard will install McnServer 8000 on your computer. To continue, click Next.
< Back
Next >
Cancel

McnServer 8000
License Agreement
Please read the following license agreement carefully.
MCN Server 8000™ & Client Software License Agreement
NOTICE
This is a legal agreement between You and CTI Products, Inc. ("CTI"). YOU MUST READ AND AGREE TO THE TERMS OF THIS SOFTWARE LICENSE AGREEMENT BEFORE
I accept the terms of the license agreement
I do not accept the terms of the license agreement
Print
InstallShield
< Back
Next >
Cancel

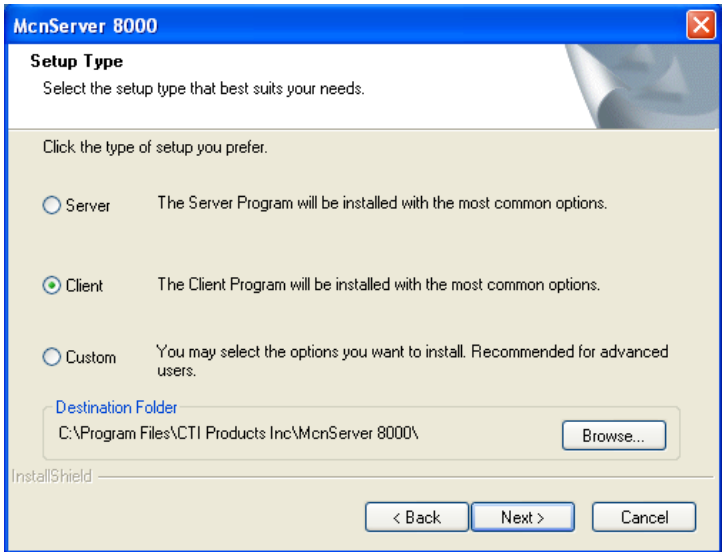
Read the License Agreement.

If you agree to the terms, click the "I Accept…" button as shown above and then hit the Next button to continue toe installation.

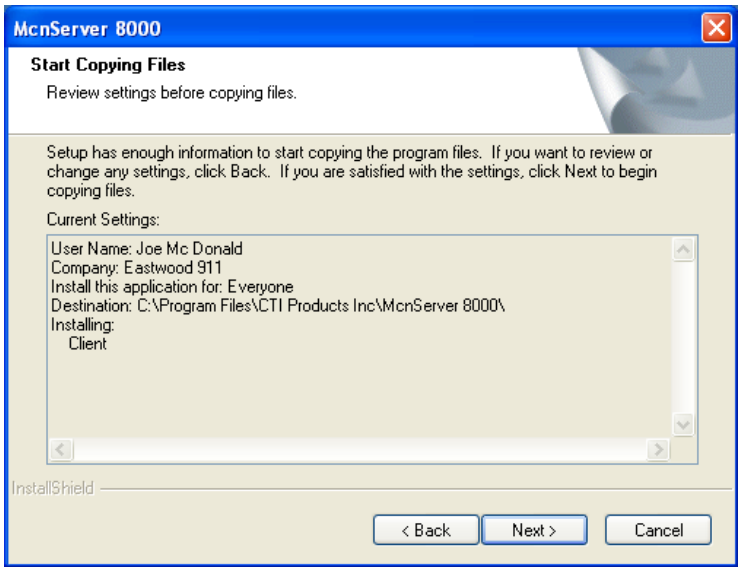
Enter your user information.



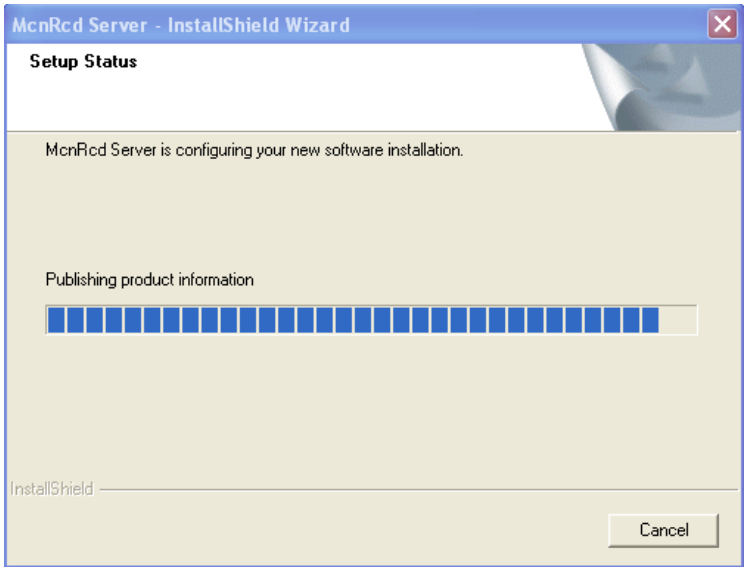
Select the "Setup Type" as "Client".


McnServer 8000
Setup Type
Select the setup type that best suits your needs.
Click the type of setup you prefer.
Server
The Server Program will be installed with the most common options.
Client
The Client Program will be installed with the most common options.
Custom
You may select the options you want to install. Recommended for advanced users.
Destination Folder
C:\Program Files\CTI Products Inc\McnServer 8000\
Browse...
InstallShield
< Back
Next >
Cancel

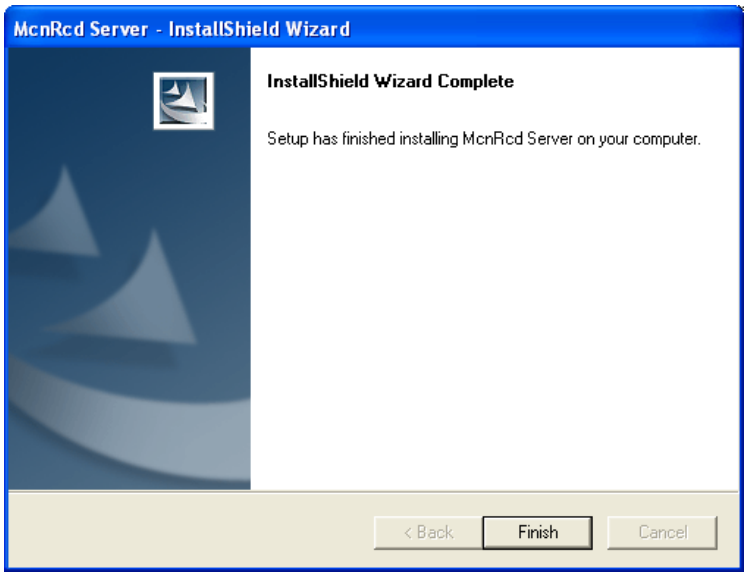
After you confirm everything is in order, hit **Next**.


McnServer 8000
Start Copying Files
Review settings before copying files.
Setup has enough information to start copying the program files. If you want to review or change any settings, click Back. If you are satisfied with the settings, click Next to begin copying files.
Current Settings:
User Name: Joe Mc Donald
Company: Eastwood 911
Install this application for: Everyone
Destination: C:\Program Files\CTI Products Inc\McnServer 8000\
Installing:
Client
InstallShield
< Back
Next >
Cancel

The Installshield program will install the files.



Click the **Finish** button to finish.

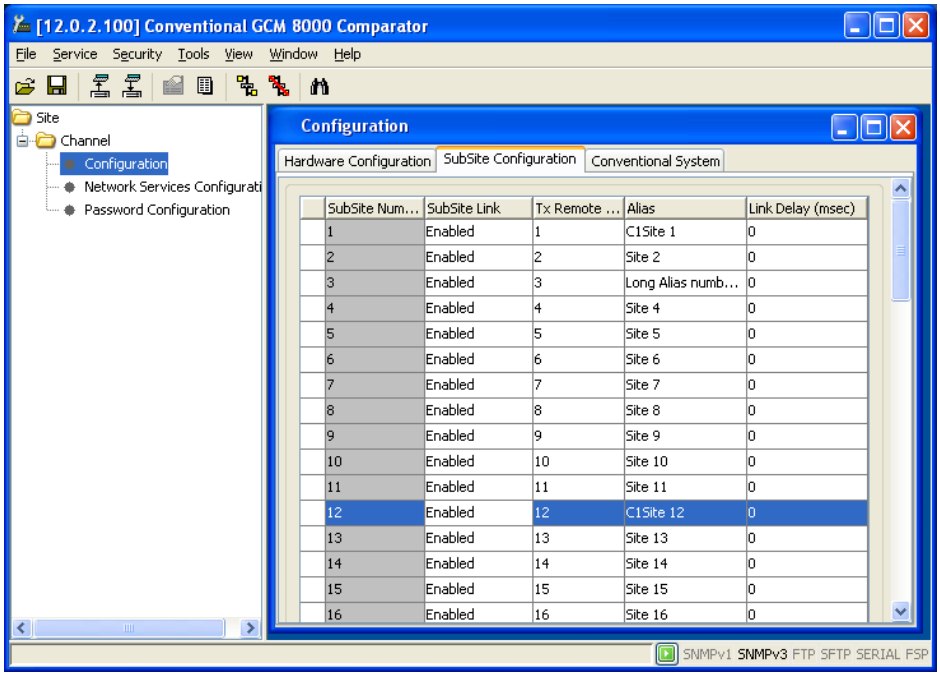


Interfacing to IP Comparators

You will use the MCN Config Server to enter information about your IP comparators and their receivers into the MCN system data files. You will need to know different information for the GCM 8000 and MLC 8000 Analog Comparators as described in the next sections. You will need the data on both the GCM 8000 and MLC 8000 Analog Comparators if you are using them in a Mixed Mode Voting Solution.

GCM 8000 Comparator Interfacing

The GCM 8000 comparator can handle up to 64 receivers, connected over IP. The GCM 8000 Comparator has 64 fixed slots or ports for the receivers that connect to it. as shown in the CSS screen shot below:


[12.0.2.100] Conventional GCM 8000 Comparator
File Service Security Tools View Window Help
Site
Channel
Configuration
Network Services Configurati
Password Configuration
Configuration
Hardware Configuration
SubSite Configuration
Conventional System
SubSite Num... SubSite Link Tx Remote ... Alias Link Delay (msec)
1 Enabled 1 C1Site 1 0
2 Enabled 2 Site 2 0
3 Enabled 3 Long Alias numb... 0
4 Enabled 4 Site 4 0
5 Enabled 5 Site 5 0
6 Enabled 6 Site 6 0
7 Enabled 7 Site 7 0
8 Enabled 8 Site 8 0
9 Enabled 9 Site 9 0
10 Enabled 10 Site 10 0
11 Enabled 11 Site 11 0
12 Enabled 12 C1Site 12 0
13 Enabled 13 Site 13 0
14 Enabled 14 Site 14 0
15 Enabled 15 Site 15 0
16 Enabled 16 Site 16 0
SNMPv1 SNMPv3 FTP SFTP SERIAL FSP

When a GCM 8000 comparator is added in MCN Config Server software, the program allocates entries for 64 receivers for the comparator in the Receiver Window. These receivers map directly to the 64 slots in the GCM 8000 comparator as shown in the SubSite Num field in the above screen shot

The Aliases in the CSS software are used for the technician's convenience to keep track of the BRs connected to the GCM 8000. The receiver names must be entered in the MCN Config Server software. The GCM 8000 CSS does not support the Windows Copy command, so you will have to enter the Aliases for the Subsites (BRs or Receivers) into the Receiver Window by hand.

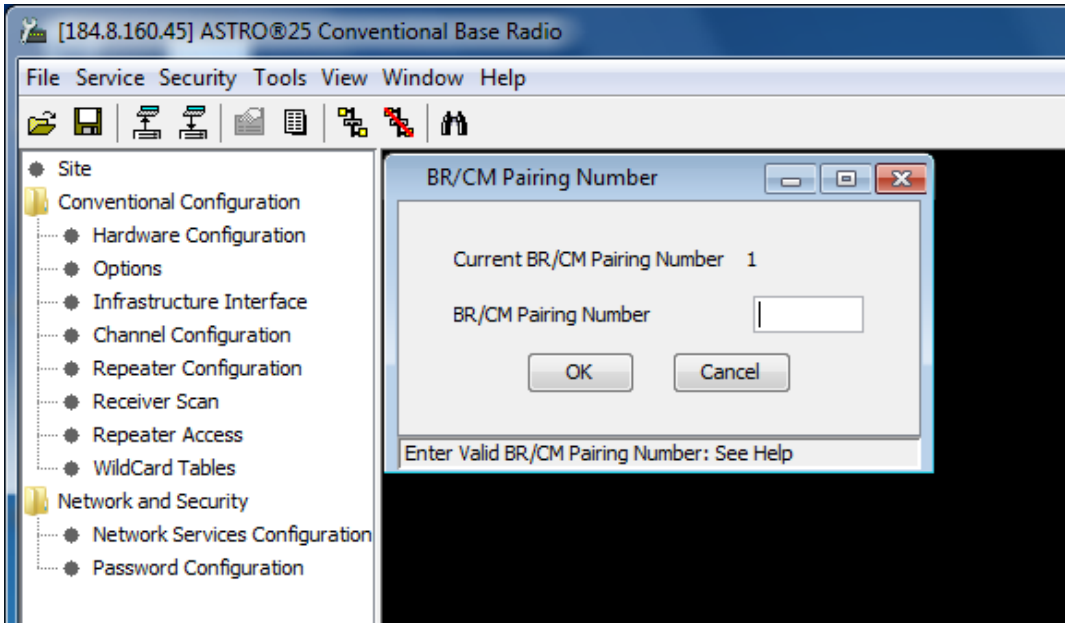
Information needed about the GCM 8000

Two types of data are needed to enter the GCM 8000 comparator into the MCN Server 8000 System Data Files:

- GCM 8000 IP Address Entered into the GCM 8000 Hardware Configuration window
- List of Receivers 1-64 Entered into the Receiver Window – for Receivers 1-64

GCM 8000 Subsite Assignment (BR/CM Pairing) Programmed in BR

The Subsites (BRs or receivers) are not assigned in the CSS for the GCM 8000 comparator. The Subsite numbers are assigned in the CSS for each of the GTR 8000 BRs and the GPW 8000 Satellite Receivers as shown below:



GCM 8000 Limitations

The GCM 8000 comparator has the following limitations

Maximum of 3 Simultaneous MCN Servers or CSS Sessions

The GCM 8000 supports only 3 simultaneous connections for real-time sessions. These sessions include:

- CTI MCN Server 8000 Software
- CSS Software

From a practical standpoint, this means that you should limit the number of MCN Servers talking to a GCM 8000 comparator to two. This will allow an open session for the CSS software.

MCN Server & CSS cannot run simultaneously on the same PC

The GCM 8000 comparator cannot talk to both the MCN Server software and the CSS software running ***on the same PC*** simultaneously.

- If you have to run CSS on the Server PC, you will have to exit the MCN Server software.
- If you have the CSS software running on the Server PC and try to start the MCN Server software, it will not communicate to the GCM 8000 comparator.

GCM 8000 Can't Disable a Failed Subsite

The legacy Astrotac 3000 and GCM 8000 comparators will not allow the user to Disable a receiver (subsite) if it is in Fail mode. This applies to both the MCN Server 8000 application and the Real-Time portion of the Motorola CSS software.

GCM 8000 Disables are Reset on Fail Condition

The GCM 8000 comparator will reset the Disable condition if a receiver (subsite) goes into Fail mode. This applies to both the MCN Server 8000 application and the Real-Time portion of the Motorola CSS software.

GCM 8000 CSS Software latches Votes

If s receiver (subsite) is Force-Voted from the CSS Local Status Screen, it will latch in the Force Vote state. No other receivers will be voted in the GCM 8000. The latched Force Vote can be unlatched from the MCN Server 8000 by pressing and releasing the left mouse button.

GCM 8000 Status Display

The possible states for the GCM 8000 subsites (receivers) include:

Displayed State	Meaning
Error	Undefined Status
Offline	Server cannot talk to the GCM 8000 comparator (Note1)
(Blank)	No Activity
DISABLE	Permanently Disabled by CSS (note the capital letters)
Disable	Disabled via MCN Server 8000 or MCN Client
Fail	Subsite Failed - Comparator cannot talk to BR
Rx	Voice Receive activity
Rx Data	Data Receive activity
Forced Vote	Force Vote (but not yet Voted)
Vote	Voted
Vote Data	Voted for Data
Last Vote	Last subsite voted (**GCM LV** Display Tables only)

The above states are defined in the **GCM 8000** and the **GCM LV** Display Tables.

Note 1: The Offline state could be caused by the following:

a. GCM 8000 IP address in the MCN System Configuration Files is wrong

b. MCN Server cannot talk to the GCM 8000 comparator (possible network problem)

c. If the MCN server has multiple NIC cards, the wrong one may be selected.

Note 2: The Last Vote indication will only be displayed when that subsite is otherwise in the Idle state.

Permanently Disabled (Unconfigured) Subsites

Permanently Disabled sites (Unconfigured) will show up as DISABLE or DIS (in capitals) to distinguish them from the subsites that are disabled from MCN Server 8000 or the CSS Local Status Screen.

MLC 8000 Analog Comparator Interfacing

The MLC 8000 Analog Comparator can also handle up to 64 receivers, connected over IP, but the linking between the MLC 8000 Analog Comparator and the MCN Server 8000 system is handled differently from the GCM 8000.

The MLC 8000 Analog Comparator is made up of two types of units:

- VGU MLC 8000 Analog Comparator (which connects to the console)
- AGU MLC 8000 Subsite Link Converter (which connects to the BRs)

We need to know information from both types of units

Information needed about the MLC 8000 Analog Comparator

The information we need to know about the MLC 8000 Analog Comparator to ether into the MCN Server 8000 System Data Files is:

- VGU IP Address — Entered into the GCM 8000 Hardware Configuration window
- Voter ID — Entered into the GCM 8000 Hardware Configuration window
- AGU BR Port ID — For each of the BRs in the system
  Entered in the MLC ID field for the receiver in the Receiver window
- AGU BR Name — Receiver name for each BR in the system
  Entered in the Name field for the receiver in the Receiver window

MLC 8000 Channel Cluster Tree

Figure 3 shows the Channel Cluster Tree in the MLC 8000 CT (Configuration Tool) software.

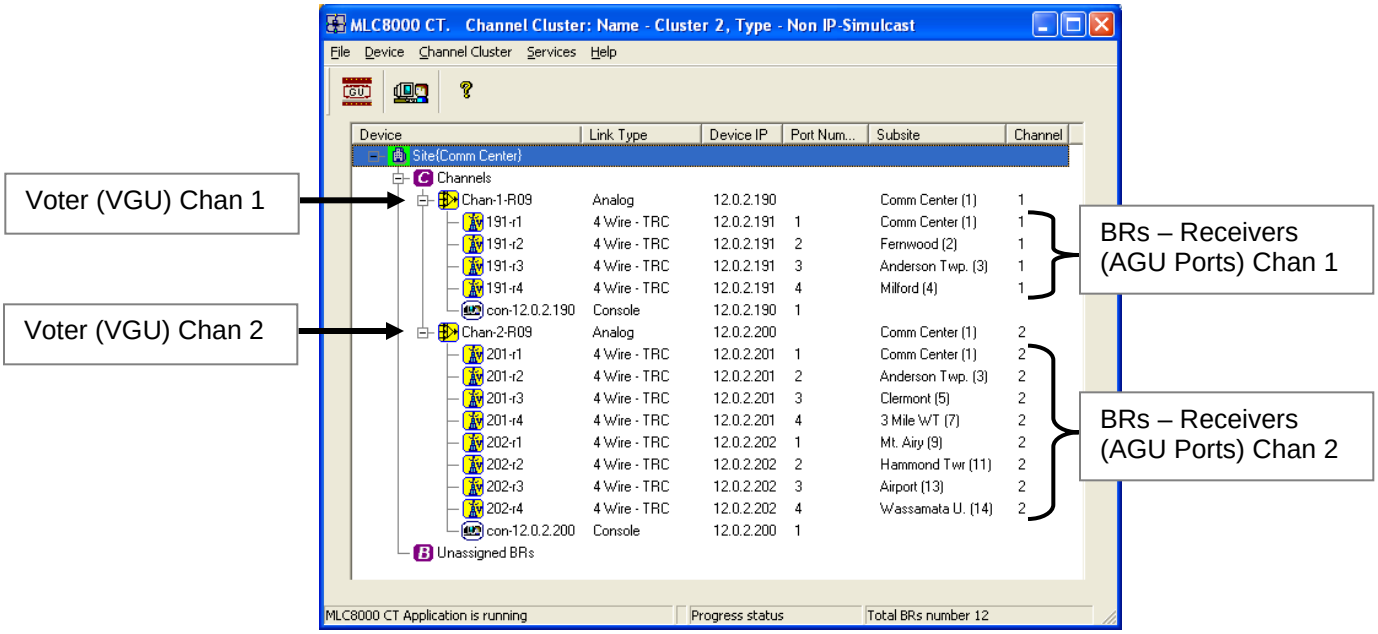

Voter (VGU) Chan 1
Voter (VGU) Chan 2
BRs – Receivers (AGU Ports) Chan 1
BRs – Receivers (AGU Ports) Chan 2
MLC8000 CT. Channel Cluster: Name - Cluster 2, Type - Non IP-Simulcast
File Device Channel Cluster Services Help
Device Link Type Device IP Port Num... Subsite Channel
Site(Comm Center)
Channels
Chan-1-R09 Analog 12.0.2.190 Comm Center (1) 1
191-r1 4 Wire - TRC 12.0.2.191 1 Comm Center (1) 1
191-r2 4 Wire - TRC 12.0.2.191 2 Fernwood (2) 1
191-r3 4 Wire - TRC 12.0.2.191 3 Anderson Twp. (3) 1
191-r4 4 Wire - TRC 12.0.2.191 4 Milford (4) 1
con-12.0.2.190 Console 12.0.2.190 1
Chan-2-R09 Analog 12.0.2.200 Comm Center (1) 2
201-r1 4 Wire - TRC 12.0.2.201 1 Comm Center (1) 2
201-r2 4 Wire - TRC 12.0.2.201 2 Anderson Twp. (3) 2
201-r3 4 Wire - TRC 12.0.2.201 3 Clermont (5) 2
201-r4 4 Wire - TRC 12.0.2.201 4 3 Mile WT (7) 2
202-r1 4 Wire - TRC 12.0.2.202 1 Mt. Airy (9) 2
202-r2 4 Wire - TRC 12.0.2.202 2 Hammond Twr (11) 2
202-r3 4 Wire - TRC 12.0.2.202 3 Airport (13) 2
202-r4 4 Wire - TRC 12.0.2.202 4 Wassamata U. (14) 2
con-12.0.2.200 Console 12.0.2.200 1
Unassigned BRs
MLC8000 CT Application is running
Progress status
Total BRs number 12

Figure 3 MMC Channel Cluster Tree in the MLC 8000 CT Software

This Channel Cluster shown in Figure 3 includes two comparators:

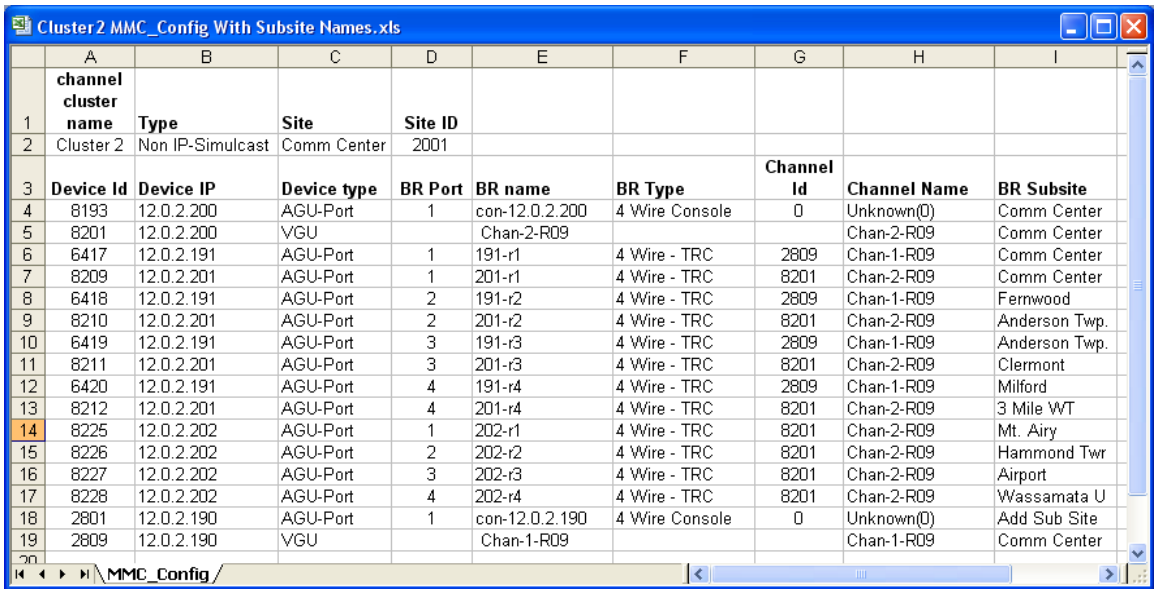
- Channel 1: 4 BRs (Receivers)
- Channel 2: 8 BRs (Receivers)

MMC_Config.csv File -- MLC 8000 Analog Comparator Data

When a Channel Cluster is saved from the MLC 8000 CT (Configuration Tool) software, the software generates a file with data that is needed for MCN Config Server software. One file is generated for each cluster (up to 4 channels). The file is typically stored at:

C:\Motorola\MLC8000 CT\ClusterName\MMC_Config.csv
(Where ***ClusterName*** is the name of the Cluster to use)

The MMC_Config file can be opened in Wordpad or Excel.



Cluster2 MMC_Config With Subsite Names.xls

	A	B	C	D	E	F	G	H	I
1	**channel cluster name**	**Type**	**Site**	**Site ID**					
2	Cluster 2	Non IP-Simulcast	Comm Center	2001					
3	**Device Id**	**Device IP**	**Device type**	**BR Port**	**BR name**	**BR Type**	**Channel Id**	**Channel Name**	**BR Subsite**
4	8193	12.0.2.200	AGU-Port	1	con-12.0.2.200	4 Wire Console	0	Unknown(0)	Comm Center
5	8201	12.0.2.200	VGU		Chan-2-R09			Chan-2-R09	Comm Center
6	6417	12.0.2.191	AGU-Port	1	191-r1	4 Wire - TRC	2809	Chan-1-R09	Comm Center
7	8209	12.0.2.201	AGU-Port	1	201-r1	4 Wire - TRC	8201	Chan-2-R09	Comm Center
8	6418	12.0.2.191	AGU-Port	2	191-r2	4 Wire - TRC	2809	Chan-1-R09	Fernwood
9	8210	12.0.2.201	AGU-Port	2	201-r2	4 Wire - TRC	8201	Chan-2-R09	Anderson Twp.
10	6419	12.0.2.191	AGU-Port	3	191-r3	4 Wire - TRC	2809	Chan-1-R09	Anderson Twp.
11	8211	12.0.2.201	AGU-Port	3	201-r3	4 Wire - TRC	8201	Chan-2-R09	Clermont
12	6420	12.0.2.191	AGU-Port	4	191-r4	4 Wire - TRC	2809	Chan-1-R09	Milford
13	8212	12.0.2.201	AGU-Port	4	201-r4	4 Wire - TRC	8201	Chan-2-R09	3 Mile WT
14	8225	12.0.2.202	AGU-Port	1	202-r1	4 Wire - TRC	8201	Chan-2-R09	Mt. Airy
15	8226	12.0.2.202	AGU-Port	2	202-r2	4 Wire - TRC	8201	Chan-2-R09	Hammond Twr
16	8227	12.0.2.202	AGU-Port	3	202-r3	4 Wire - TRC	8201	Chan-2-R09	Airport
17	8228	12.0.2.202	AGU-Port	4	202-r4	4 Wire - TRC	8201	Chan-2-R09	Wassamata U
18	2801	12.0.2.190	AGU-Port	1	con-12.0.2.190	4 Wire Console	0	Unknown(0)	Add Sub Site
19	2809	12.0.2.190	VGU		Chan-1-R09			Chan-1-R09	Comm Center
20									

MMC_Config

Figure 4 MMC_Config File – Formatted in Excel

Figure 4 shows an MMC_Config file opened in Excel with some formatting added. The format of the file may change from version to version of the MLC 8000 CT software.

Sorting the MMC_Config File

The MMC_Config file does not always have the items ordered as one would expect. Channels 1 & 2 in Figure 4 are intermixed. If this is a problem (especially with larger systems), it is recommended that you sort the portion of the file relating to the AGUs and VGUs.

1. Open the file in Excel.
2. Saved as XLS file.
3. Add formatting as required.
4. Sort the Devices portion of the file (with the AGU & VGU information.). Sort By:
   Channel Name
   Device IP
   BR Port
5. Re-save the file.

   Note:

   We recommend NOT re-saving the file to the CSV format (unless you make a copy with a different name).

   It is easy to corrupt a file and make it unusable for the CT program.

Figure 5shows the Sort process.

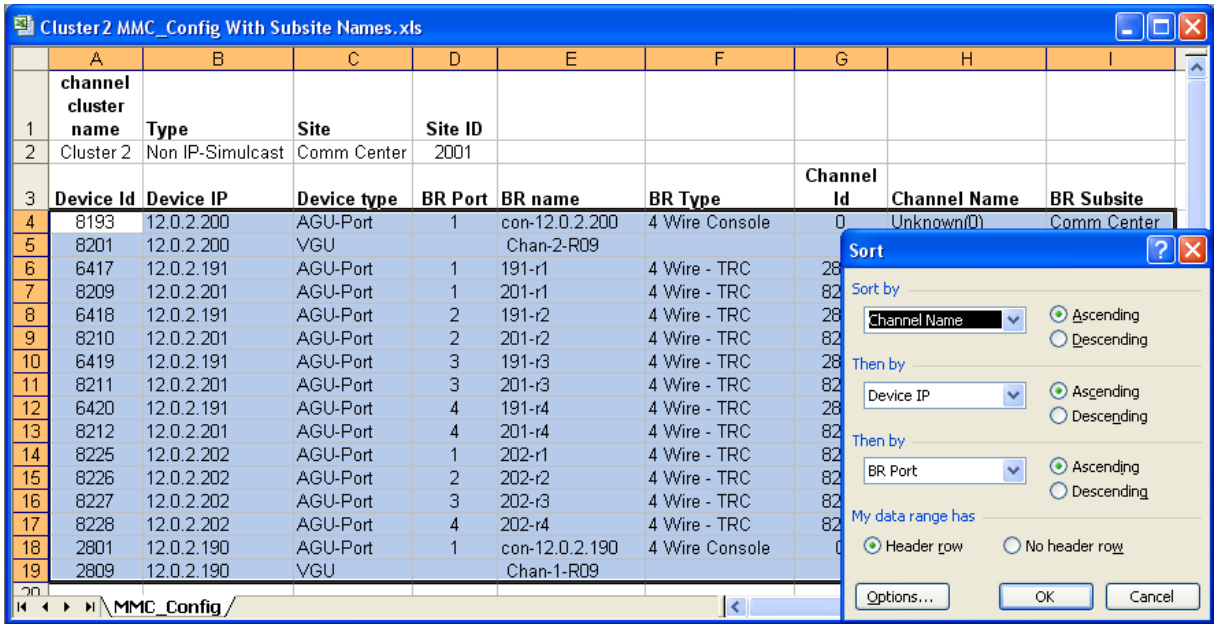
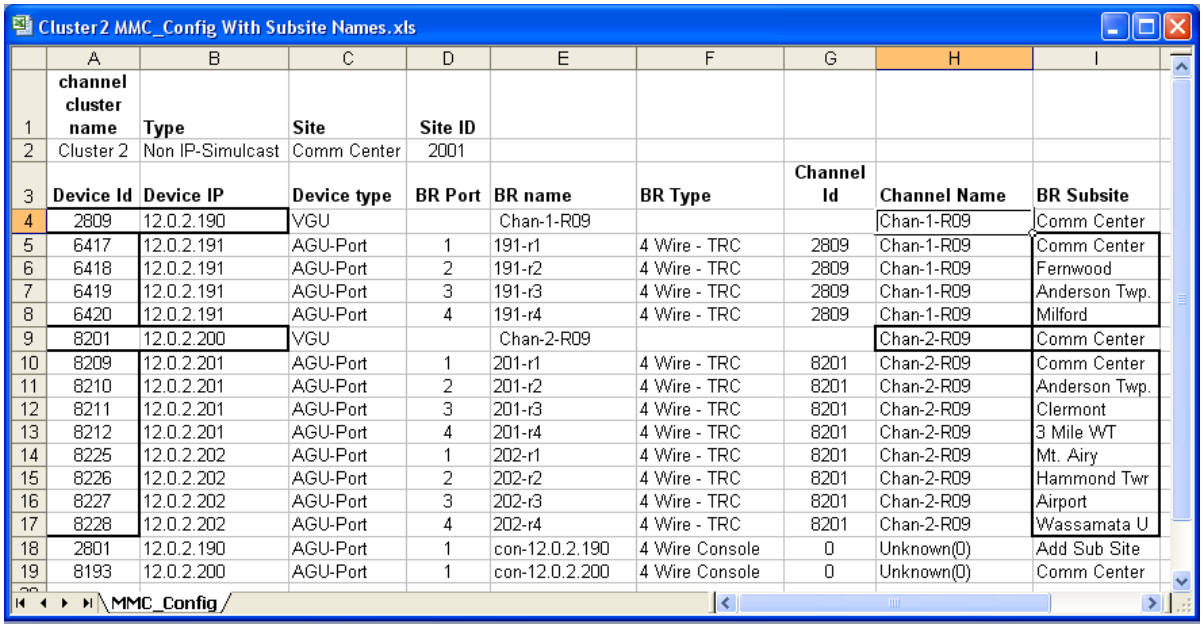


Figure 5 Sorting the MMC_Config File

The sorted result is shown in Figure 6,

After the sort:

- The Channels will be together.
- However, the BRs (AGU Ports) will not necessarily in BR List Order



	A	B	C	D	E	F	G	H	I
1	channel cluster name	Type	Site	Site ID					
2	Cluster 2	Non IP-Simulcast	Comm Center	2001					
3	Device Id	Device IP	Device type	BR Port	BR name	BR Type	Channel Id	Channel Name	BR Subsite
4	2809	12.0.2.190	VGU		Chan-1-R09			Chan-1-R09	Comm Center
5	6417	12.0.2.191	AGU-Port	1	191-r1	4 Wire - TRC	2809	Chan-1-R09	Comm Center
6	6418	12.0.2.191	AGU-Port	2	191-r2	4 Wire - TRC	2809	Chan-1-R09	Fernwood
7	6419	12.0.2.191	AGU-Port	3	191-r3	4 Wire - TRC	2809	Chan-1-R09	Anderson Twp.
8	6420	12.0.2.191	AGU-Port	4	191-r4	4 Wire - TRC	2809	Chan-1-R09	Milford
9	8201	12.0.2.200	VGU		Chan-2-R09			Chan-2-R09	Comm Center
10	8209	12.0.2.201	AGU-Port	1	201-r1	4 Wire - TRC	8201	Chan-2-R09	Comm Center
11	8210	12.0.2.201	AGU-Port	2	201-r2	4 Wire - TRC	8201	Chan-2-R09	Anderson Twp.
12	8211	12.0.2.201	AGU-Port	3	201-r3	4 Wire - TRC	8201	Chan-2-R09	Clermont
13	8212	12.0.2.201	AGU-Port	4	201-r4	4 Wire - TRC	8201	Chan-2-R09	3 Mile WT
14	8225	12.0.2.202	AGU-Port	1	202-r1	4 Wire - TRC	8201	Chan-2-R09	Mt. Airy
15	8226	12.0.2.202	AGU-Port	2	202-r2	4 Wire - TRC	8201	Chan-2-R09	Hammond Twr
16	8227	12.0.2.202	AGU-Port	3	202-r3	4 Wire - TRC	8201	Chan-2-R09	Airport
17	8228	12.0.2.202	AGU-Port	4	202-r4	4 Wire - TRC	8201	Chan-2-R09	Wassamata U
18	2801	12.0.2.190	AGU-Port	1	con-12.0.2.190	4 Wire Console	0	Unknown(0)	Add Sub Site
19	8193	12.0.2.200	AGU-Port	1	con-12.0.2.200	4 Wire Console	0	Unknown(0)	Comm Center

Figure 6 Sorted MMC_Config file with additional formatting

Figure 6 shows two radio channels, each with its own voters and BRs. For each of the channels:

- The top horizontal rectangles show the:
  Voter ID (Device Id field)
  VGU IP Address (Device IP field)
  Channel Name (Channel Name field)
- The vertical rectangles shows the:
  AGU Port IDs (Device ID Field)
  Receiver Names (BR Subsite field)

Note that the Channel IDs (2809 & 8201) correspond to the VGU IDs.

Copying and Pasting from the MMC_Config file

There is no automatic import of the data from the MMC_Config.csv file into the MCN Server 8000 system configuration files. You can, however, open the MMC_Config.csv file in Excel and copy & paste the information into the fields in the Receiver Window in MCN Config Server:

MMC_Config Field	**Receiver Window Field**
Device ID (for BRs / Receivers)	MLC ID
BR Subsite	Name
BR Name	Description (for general reference)

Here are a few things to consider when copying the data into the system configuration files in MCN Config::

- Be sure that the Subsites are in the right order.
  If they are not, you can copy the Subsite values and names one at a time.
- If you have a Mixed Mode system, make sure that the Subsites are in the order that matches the BR Subsite order in the GCM 8000 comparator. If they are not, you can copy the Subsite values and names one at a time.
- The Subsite Names in the MMC_Config.csv file might not be in the format that you want displayed. You may have to edit these values for the user in MCNConfig Server.
- You can include the AGU IP Address and Port number in the Description field in the Receiver Window. This can be helpful for error logging and troubleshooting.

MLC 8000 Analog Comparator Data for multiple radio channels

The MLC 8000 Analog Comparator CT software can store data for up to 4 channels in a Channel Cluster.

If your system has more than 4 radio channels using MLC 8000 Analog Comparators, you will need to save the system data in groups of 4 radio channels. You will need to open separate MMC_cfg.csv files for each channel cluster.

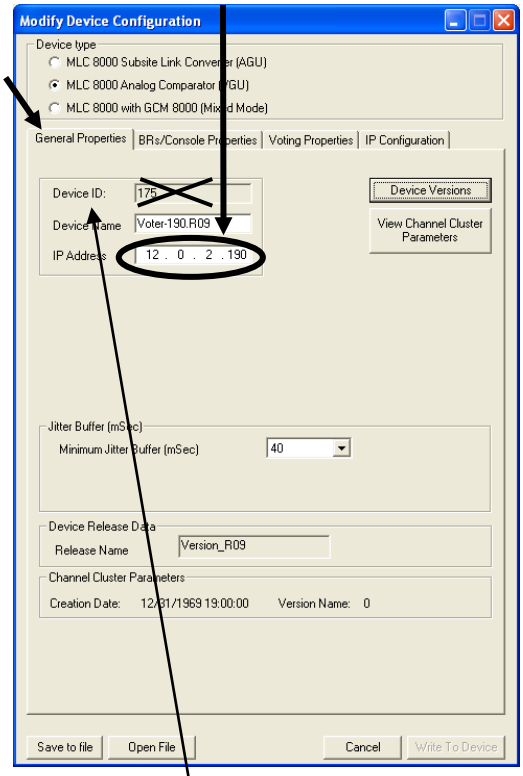
MLC 8000 Analog Comparator CT Software Examples

The following sections show where the MLC 8000 Analog Comparator information is configured. The screen captures are based on CT Version 2.24. Screens for newer versions may be different.

MLC 8000 Analog Comparator (VGU) Configuration

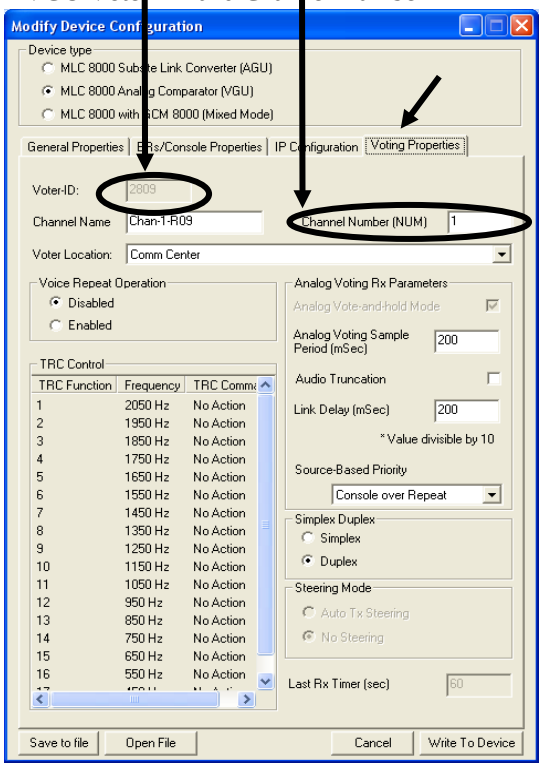
Right-Click on an MLC 8000 Analog Comparator (VGU) from the main device tree and select **Configure Device**.

The **General Properties** tab has the VGU IP Address



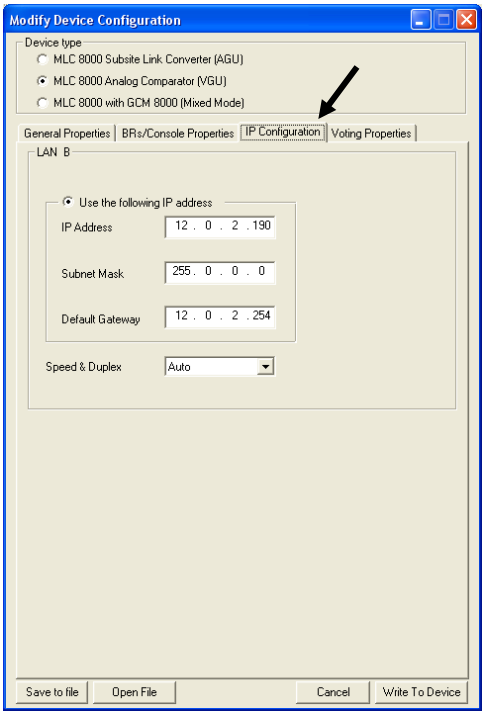
Note: The Device ID in the General Properties. tab is **NOT** the Voter ID.

The **Voter Properties** tab has the VGU Voter ID and Channel Number



The **Voter ID** is shown in the **Voting Properties** tab above (2809)

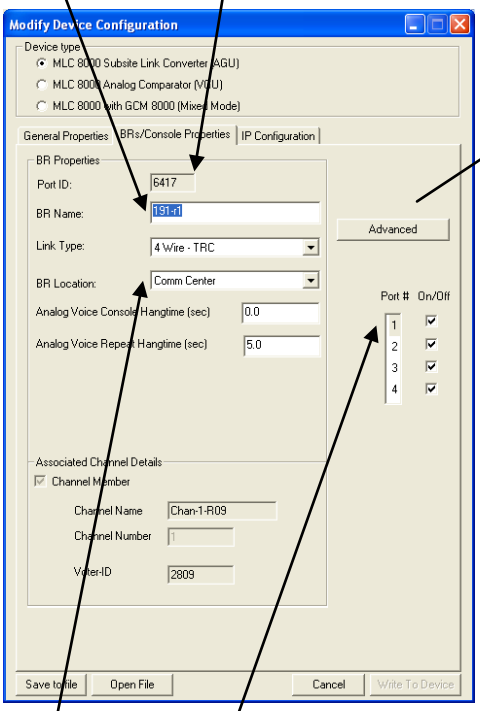
The **IP configuration** tab
has more detailed IP parameters.



MLC 8000 Subsite Link Converter (AGU) Configuration

Right-Click on an MLC 8000 Subsite Link Converter (AGU) Port (BR) from the main device tree and select **Configure Device**.

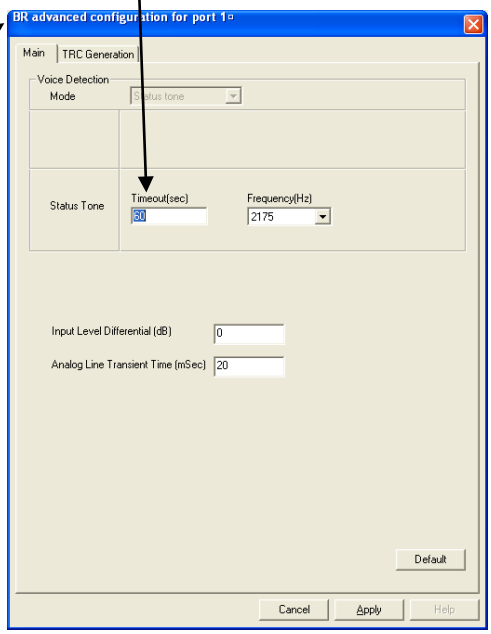
The **BR/Console Properties** tab has the BR Name, and AGU Port ID (MLC ID)



Subsite

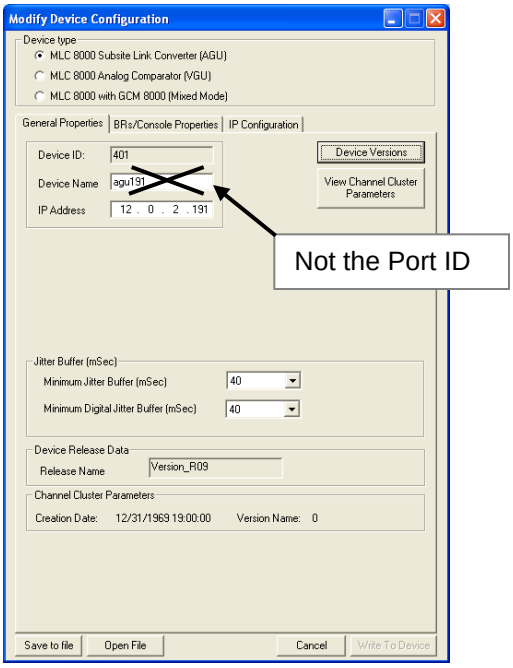
The **Port** box selects which port to display from the AGU.

The **Advanced Properties** window has the **Status Tone Timeout**

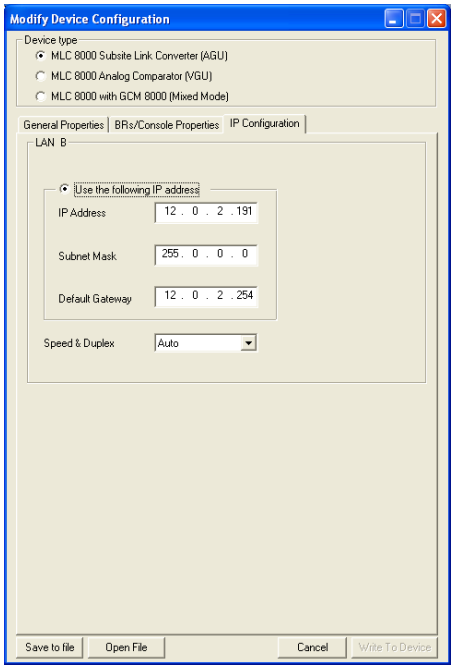


The **Status Tone Timeout** will determine the length of time from loss of Status Tone to a Fail indication. Default is 60 Seconds.

The **General Properties** tab has the Device Name and IP Address



The **IP Configuration** tab has the Detailed IP information

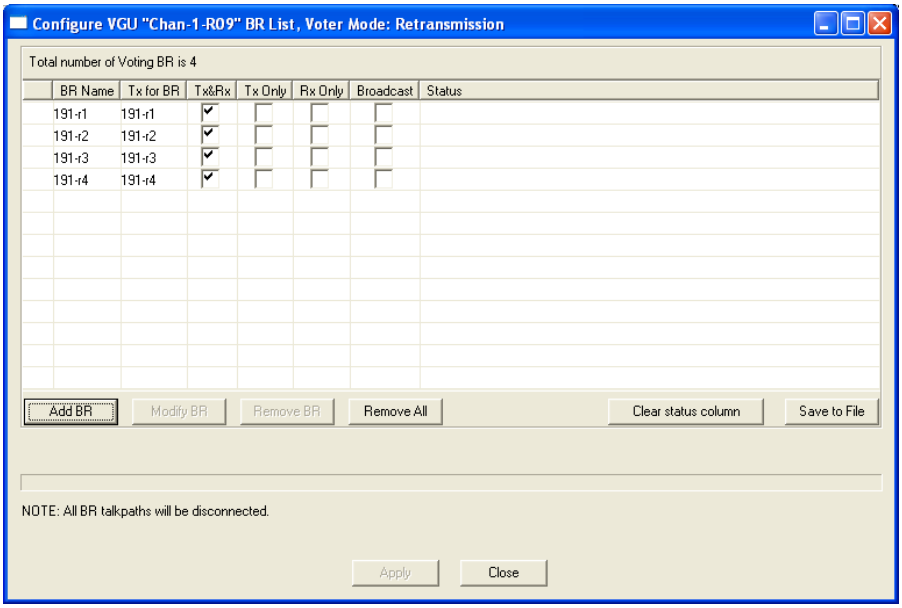


The MCN System does not need to know the AGU IP Address, but it can be helpful in troubleshooting.

BR List

Highlight the Voter and select **Edit BR List** button.

The window shows the lineup of BRs for the channel.



MLC 8000 Analog Comparator Limitations

The MLC 8000 Analog Comparator has the following limitations

Maximum of 15 Simultaneous MCN Servers or CSS Sessions

The MLC 8000 Analog Comparator supports 15 simultaneous connections for real-time sessions. These sessions include:

- CTI MCN Server 8000 Software
- MLC 8000 CT / DA Software

From a practical standpoint, this should not pose a problem since systems will normally not have more than 1 or 2 MCN Server PCs.

MCN Server & CT / DA software cannot run simultaneously on the same PC

The MLC 8000 Analog Comparator cannot talk to both the MCN Server software and the MLC 8000 CT / DA software running ***on the same PC*** simultaneously.

- If you have to run CT software on the Server PC, you will have to exit the MCN Server software.
- If you have the CT software running on the Server PC and try to start the MCN Server software, it will not communicate to the MLC 8000 Analog Comparator. You will have to close the CT software first.

MLC 8000 Analog Comparator Status Display Tables

MLC 8000 and MLC LV Display Tables

The possible states for the MLC 8000 Analog Comparator subsites (receivers) include:

Displayed State	Meaning
Error	Undefined Status
Offline	Server cannot communicate with MLC 8000 Comparator (Note 1)
Config Err	(Note 2)
(Blank)	No Activity
Disable	Disabled via MCN Server 8000 or MCN Client
Fail	Subsite Failed - Comparator cannot communicate to BR (Note 3)
Rx	Voice Receive activity
Forced Vote	Force Vote (but not yet Voted)
Vote	Voted
Last Vote	Last subsite voted (LV Display Tables only)

The above states are defined in the **MLC 8000** and the **MLC LV** Display Tables.

Note 1: The Offline state could be caused by the following:

a. GCM 8000 IP address in the MCN System Configuration Files is wrong

b. GCM 8000 Voter ID in the MCN System Configuration Files is wrong (See the Network Interface window.)

c. MCN Server cannot talk to the MLC 8000 Comparator (possible network problem).

d. If the MCN Server has multiple NIC cards, the wrong one may be selected.

Note 2: The Config Err state could be caused by the following:

a. The MLC ID in the MCN System Configuration Files (Receiver window) is wrong.

b. The MLC 8000 Analog Comparator BR is configured in the MCN System Configuration Files (Receiver window) but it is not configured in the MLC 8000 Comparator BR List.

c. The MLC 8000 Analog Comparator is online, has not sent a status update for this BR.

Note 3: The Fail state could be caused by the following:

a. The BR analog port is disconnected from the MLC 8000 Subsite Link Converter (AGU).

b. The BR has lost power.

c. There is no status tone from the BR

d. The Radio Port for this MLC 8000 Subsite Link Converter (AGU) is not calibrated properly (See the CT software for calibration)

e. The MLC 8000 Analog Comparator (VGU) cannot communicate with the appropriate MLC 8000 Subsite Link Converter (AGU). In this case, all the BRs associated with this MLC 8000 Subsite Link Converter (AGU) will be in the Fail state.

Note 4: The Last Vote indication will only be displayed when that subsite is otherwise in the Idle state.

WARNING: DO NOT ATTEMPT TO CHANGE THE BIT VALUES OR ENTRY ORDER IN THE DISPLAY TABLE.

MLC Tech Display Table

The MLC Tech Display Table is provided to help technicians troubleshoot MLC 8000 Analog Comparator systems. Separate screens or tabs can be set up using this Display Table for Technician use.

The MLC Tech Display Table adds the more technical indication to the display including Signal Quality and TX indication. The possible states for the MLC 8000 Analog Comparator subsites (receivers) using this Display Table are:

Displayed State	Meaning
Error	Undefined Status
Offline	Server cannot communicate with MLC 8000 Analog Comparator (Note 1)
Config Err	(Note 2)
(Blank)	No Activity
Disable	Disabled via MCN Server 8000 or MCN Client
Fail	Subsite Failed - Comparator cannot communicate to BR (Note 3)
Rx	Receive Signal Quality 0
| Rx	Receive Signal Quality 1
|| Rx	Receive Signal Quality 2
||| Rx	Receive Signal Quality 3
|||| Rx	Receive Signal Quality 4
||||| Rx	Receive Signal Quality 5
TX	Transmit Active
Tx/Rx	Tx & Rx Signal Quality 0
| Tx/Rx	Tx & Rx Signal Quality 1
|| Tx/Rx	Tx & Rx Signal Quality 2
||| Tx/Rx	Tx & Rx Signal Quality 3
|||| Tx/Rx	Tx & Rx Signal Quality 4
||||| Tx/Rx	Tx & Rx Signal Quality 5
Vote	Vote Signal Quality 0
| Vote	Vote Signal Quality 1
|| Vote	Vote Signal Quality 2
||| Vote	Vote Signal Quality 3
|||| Vote	Vote Signal Quality 4
||||| Vote	Vote Signal Quality 5
Last Vote	Last subsite voted (LV Display Tables only)

The above states are defined in the **MLC Tech** Display Table only.

Notes 1-4: Same as for previous table.

Note 5: This table is best used with a fixed width font (such as Courier New) so that the signal bars align.

Note 6: Do not use this Display Table for normal users. It will be too cluttered.

WARNING: DO NOT ATTEMPT TO CHANGE THE BIT VALUES OR ENTRY ORDER IN THE DISPLAY TABLE.

MM - Mixed Mode Voting Solution Interfacing

The Mixed Mode Voting Solution is a combination of a GCM 8000 Comparator and an MLC 8000 Analog Comparator. When interfacing to a Mixed Mode system, you will need the information from both of those comparators:

GCM 8000 Information:

- GCM 8000 IP Address — Entered into the Mixed Mode Configuration window
- List of Receivers 1-32 — Entered into the Receiver Window – for Receivers (Subsites) 1-32

MLC 8000 Analog Comparator Information:

- VGU IP Address — Entered into the Mixed Mode Configuration window
- Voter ID — Entered into the Mixed Mode Configuration window
- AGU BR Port ID — For each of the BRs in the system
Entered in the MLC ID field for the receiver in the Receiver window
- AGU BR Name — Receiver name for each BR in the system
Entered in the Name field for the receiver in the Receiver window

Receiver (Subsite) Order for Mixed Mode Systems -- Very Important!

Since a Mixed Mode system uses both a Digital (GCM 8000) and a MLC 8000 Analog Comparator, it is very important to make sure that the receiver (subsite) information is entered into the MCN Config Server program in the proper order. The following principles hold in determining the receiver order:

1. Each radio channel may have different receiver (Subsite) orders.
2. If there are multiple radio channels with the same complement of Subsite locations, it is recommended that the Subsites in all channels be configured in the same order.
3. The Subsite numbers configured in the GTR 8000 BRs and GPW 8000 Satellite Receivers for a particular radio channel control the Subsite order in that channel's GCM 8000 comparator.
4. Since the Subsite name can be hand-entered in the GCM 8000 comparator CSS, it is possible to enter the wrong Subsite name. Make sure that the list of Subsite names in the GCM 8000 CSS matches the actual order of the GTR 8000 and GPW 8000 units.
5. The Subsite order (1-64) in the GCM 8000 comparator controls the receiver order (1-64) in the Receiver Window in the MCN Config Server software.
6. Enter the proper Receiver Names (as determined by the GCM 8000 Subsite order) in the MCN Config Server Software Receiver Window.
7. The Subsites listed in the MLC 8000 Analog Comparator CT software (and the resulting MMC_Config.csv file) are listed in the order that they were entered when the system was configured in the CT software. **This order might not be the same as the order in the GCM 8000 comparator.**

   It is recommended that the order is kept the same, but it is not imperative that it is.
8. After the receiver Subsite information from the GCM 8000 is entered into the MCN Config Server software, enter the proper AGU Port ID in the MLC ID field for that subsite.

Mixed Mode System Limitations

Mixed Mode systems will have the same limitations as their constituent GCM 8000 and MLC 8000 Analog Comparators as described in the CGM 8000 and MLC 8000 Analog Comparator Limitations sections:

- Maximum of 3 MCN Servers connected to the GCM 8000 comparators. If the MCN Servers are in an Astro™ 25 RNI, the RNI infrastructure supports only 2 MCN Server 8000 PCs.
- Neither the GCM 8000 CSS software nor the MLC 8000 Analog Comparator CT / DA software can run simultaneously on the same PC as the MCN Server.
- The GCM 8000 comparator cannot disable subsites that have failed
- The GCM 8000 comparator will reset the Disable status if a subsite goes into Fail.

Mixed Mode Status Display

The possible states for Mixed Mode comparator systems using the **Mixed Mode** and the **MM LV** Display Tables are:

Displayed State	Meaning
Error - Undefined	Undefined Status
(Blank)	No Activity
Cfg Err A	Configuration Error MLC
Offline D	Offline GCM
Offline D / Cfg Err A	Offline GCM & Config Error MLC
Offline A	Offline MLC
Fail A	Fail MLC
Fail D	Fail GCM
Fail D / Cfg Err A	Fail GCM & Config MLC
Fail D + A	Fail Both
Dis A	Disable MLC
Dis D	Disable GCM
Dis D + A	Disable both
DIS D + A	Permanently Disable GCM & Disable MLC
Dis A / Fail D	Disable MLC & Fail GCM
Dis D / Fail A	Disable GCM & Fail MLC
DIS D / Fail A	Permanent Disable GCM & Fail MLC
Dis D / Cfg Err A	Disable GCM & Config Err MLC
DIS D / Cfg Err A	Permanent Disable GCM & Config Err MLC
Offline D / Fail A	Offline GCM & Fail MLC
Offline D / Dis A	Offline GCM & Fail MLC
Offline A / Fail D	Offline MLC & Fail GCM
Offline A / Dis D	Offline MLC & Disable GCM
Offline A / DIS D	Offline MLC & Permanently Disable GCM
Offline A + D	Offline both
Rx	Voice Receive activity
Rx Data	Data Receive activity
Forced Vote	Force Vote (but not yet Voted)
Vote	Voted
Vote Data	Voted for Data
Last Vote	Last subsite voted (LV Display Tables only)

The above states are defined in the **Mixed Mode** and the **MM LV** Display Tables.

Note 1 The notes from the other IP Comparator Display Tables apply as appropriate.

Note 2: "A" = Analog (MLC 8000 Analog Comparator); "D" = Digital (GCM 8000)

Note 3: In normal operation, only a few of these states will be displayed.

Note 4: Active Call states (Vote, Rx) will take priority over background states (Idle, Dis, Fail, Offline)

Note 5: Active Call states for Digital (GCM 8000) will have priority over Analog calls.

Note 6: The implementation of this Display Table is extremely complicated. The above states are not in the same order as they appear in the real Display Table.

WARNING: DO NOT ATTEMPT TO CHANGE THE BIT VALUES OR ENTRY ORDER IN THE DISPLAY TABLE.

Mixed Mode Tech Status Displays

The MM Tech Display Tables are provided to help technicians troubleshoot Mixed Mode systems. Separate screens or tabs can be set up using these Display Tables for Technician use.

MM Tech Display Table

The MM Tech Display Table is similar to the MM LV Display table, except it adds more detail in the cases of both Digital and Analog Activity at the same time. It has the following modifications:

- Added "D" or "A" suffix for Rx & Vote states
- When there is both Digital & Analog activity, both are shown.
- Analog Rx is changed to a brownish color.
- Analog Vote is changed to a violet color

You can look at this Display Table in the Display Table window in MCN Config Server software.

MM-GCM Tech Display Table

This Display Table is for Mixed Mode systems, but it looks at only the GCM 8000 (Digital) signals, plus the Last Vote. It is somewhat similar to the **GCM LV** Display Table It can be used for troubleshooting a Mixed Mode system if you want to look just at the GCM 8000 data.

You can look at this Display Table in the Display Table window in MCN Config Server software.

Note 1: The Last Vote indication will be set on either digital or analog activity.

MM-MLC Tech Display Table

This Display Table is for Mixed Mode systems, but it looks at only the signals from the MLC 8000 Analog Comparator, plus the Last Vote. It is somewhat similar to the **MLC LV** Display Table It can be used for troubleshooting a Mixed Mode system if you want to look just at the data from the MLC 8000 Analog Comparator.

You can look at this Display Table in the Display Table window in MCN Config Server software.

Note 1: The Last Vote indication will be set on either digital or analog activity.

Note 2: If there is both analog and digital activity, you will not see a Vote indication using this table since the MLC 8000 Analog Comparator Vote bit is suppressed in the program whenever there is a Vote in the GCM 8000.

Interfacing to Legacy Equipment

The MCN Server 8000 communicates to Legacy Equipment (Non-IP comparators and I/O devices) via modules attached to the MCN Monitoring and Control Network:

Device	MCN Module Type
Astrotac 3000 Comparators	AIB Modules
Digitac Comparators	CIB Modules
Spectra-TAC Comparators	CIB Modules
Competitive Comparators	CIB Modules
I/O & Alarm Points	GPIO Modules

The MCN modules shown above all communicate on a 78 Kbit wired network.

Larger systems may include a 1.25 Mbps high-speed backbone network that connects to the MCN modules through MCN Routers and EXB Network Extender Modules.

The MCN Server 8000 connects to IP comparators directly through an IP network, but it connects to the MCN networks through a discrete Network Interface. The following types are available:

Network Interface	Type	MCN Network Speed
HIB-IP	IP Module	78 Kbps
HIB-232	RS-232 Serial	78 Kbps
PCLTA-21-78K	PCI Board	78 Kbps
PCLTA-21-1250K	PCI Board	1.25 Mbps

The standard MCN Server 8000 software can support a single Network Interface (usually a HIB-IP unit). Additional Network Interfaces can be supported by purchasing expansion options.

When interfacing to legacy equipment using MCN modules, you will need to know:

- **Network Interface Information (entered in Network Interface window):**
  Network Interface Type
  Network Interface Parameters
  MCN Group & Module addresses
  IP parameters (for HIB-IP units)

- **MCN Module Information (entered in Hardware window)**
  Module Type
  MCN Group & Module addresses

- **Receiver & I/O Point Information (entered in Receiver window)**
  Receiver and/or I/O Point Name
  Type of Display Table to use (Comparator, Alarm, Door, etc.)

The Configuring a System - McnConfig Server 8000 Program section of this manual has references to the above items throughout.

More information on the MCN modules, and the MCN network can be found in the appropriate manuals. See the Reference Documents section of this manual for a list of manuals.

System Considerations

IP Networking Considerations

- For ASTRO® 25 systems, all equipment (IP Comparators, HIB-IP units, MCN Server, and Clients) must be located at the proper sites and connected to the proper IP switches according to the Motorola IP Plan (per specific ASTRO® 25 release).
- For ASTRO® 25 systems, the appropriate CTI Products, Inc. equipment must be enabled in the MSI TNCT tool (done at the factory) to enable appropriate IP routing for the CTI Products hardware and software.
- For operation on other systems, the installer should consult with the customer's network engineers for proper settings.
- IP network infrastructure equipment (switches, routers, etc.) must be configured properly to allow communication between the IP comparators, the MCN Server 8000, HIB-IP units, and the MCN Clients.
- The IP network routers and switches must be configured to pass IP Multicast traffic from the MCN Server to the Clients.
- The system requires static IP addresses for the following items:
  MCN Server 8000 PC
  ClientRCD PCs
  HIB-IP units
  GCM 8000 & MLC 8000 IP Comparators
  Multicast IP Address for Server to Client traffic.

  All IP addresses, IP Subnets, and Subnet Masks should be set based on the proper settings for the particular system.

Software Co-habitation and PC Locations

- For ASTRO® 25 7.13 systems, MCN Server 8000 software may be installed on:
  Stand-Alone PC
  Co-Habbed on an NM Client PC.
- For ASTRO® 25 7.13 systems, ClientRCD software may be installed on:
  Stand-Alone PC
  Co-Habbed on an NM Client PC.
  Co-Habbed on an MCC 7500 Console PC
- For ASTRO® 25 7.13 systems, the various components of an MCN system (MCN Server 8000, Client RCD, HIB-IP units, and IP comparators cannot bridge the RNI-CEN demarcation point. There are two possible configurations:
  a. All components must be within the RNI or
  b. All components must be outside the RNI in the CEN.

- For ASTRO® 25 7.13 systems, the PCs running MCN Server 8000 and ClientRCD software may be installed only at the following locations:
  Zone Core (Not on NM Subnet – no Multicast support)
  K-Core
  Collocated Vortex / NM Dispatch Site in Zore Core

  Note: A Vortex /NM Dispatch Site may not be able to communicate with all the comparators at other sites. Only Zone Core or K-Core or collocated Vortex / NM Dispatch Site in Zore Core is available to see all the comparators.

- For systems not running in an official MSI RNI, some of the above limitations may not apply, but the non ASTRO®-specific considerations will apply.

Valid locations on the A7.13 RNI are shown below

	Co-located Vortex Site in Zone Core	Co-located NM Site in Zone Core	IP Simulcast Prime Site	Conventional Hub
MCN Server 8000	**Yes**	**Yes**	**No**	**Yes**
CTI Client	**Yes**	**Yes**	**No**	**Yes**
HIB-IP	**No**	**No**	**Yes**	**Yes**

HIB-IP Considerations

- Legacy HIB-IP modules (versions below 400) are not intended for operation across an Astro® 25 7x Radio Network Infrastructure (RNI).
- HIB-IP 8000 modules (HIB-IP modules version 400 and up) support special UDP Ports required to run across an Astro® 25 7.13 RNI.
- For ASTRO® 25 7.13 systems, HIB-IP modules may be installed only in the following locations:
  Simulcast IP Prime Sites
  Conventional Hub (C-Sub Hub) Sites

Default Software Settings

- The defaults in the MCN Server 8000 and the MCN Client are configured to run in an ASTRO® 25 7.12 system and higher.
- The default UDP ports for the Server and Client are set according to Motorola's IP plan (per specific ASTRO® 25 release).
- The default Multicast IP address for the MCN Server 8000 software is configured for:
  MCN Server #1 in Zone 1 at the Main Prime site.
  If your system configuration is different, please refer to the Motorola IP Plan (per specific ASTRO® 25 release) for the proper Multicast IP address.

Windows Accounts

In general, the programs should be run with the least privileges consistent with proper program operation.. The programs need the following rights::

- Setup.exe (Installation) Administrator
- HWSetup Administrator
- MCN Config Server 8000 Administrator
- MCN Server 8000 User (Note 1)
- ClientRCD User (Note 2)

Note 1 Depending on the rights on various files and folders, Administrator rights may be needed when configuring IP settings and changing other system settings.

Note 2 Depending on the rights on various files and folders, Administrator rights may be needed when configuring the IP settings for the Client, and the list of IP addresses for the Server(s).

Permissions File Locations & Permissions

The default installation locations for the MCN Server 8000 Server and Client systems (for Windows 7) are:

MCN Server 8000

Program Files C:\Program Files (x86)\CTI Products Inc\McnServer 8000

Example Files C:\Program Files (x86)\CTI Products Inc\McnServer 8000\Example System

Config Log: C:\ProgramData\CTI Products Inc\McnConfig
McnConfig.log

System Log: C:\ProgramData\CTI Products Inc\McnRcd
McnSystem.log Users must have Read & **Write** access rights

Run-Time Log: C:\ProgramData\CTI Products Inc\McnRcd
MCNRCD.log Users must have Read & **Write** access rights

Saving System Configuration Files from MCN Config Server:

- Save to a folder in which User accounts have **Read** rights.
- Do not save to the Program folder.

MCN Client

Program Files C:\Program Files (x86)\CTI Products Inc\McnServer 8000

Server List C:\ProgramData\CTI Products Inc\McnClient
ServerList.RcdCli Users must have Read & **Write** access rights

Cache Files: C:\ProgramData\CTI Products Inc\McnClient\cache
*.RcdChe FILES Users must have Read & **Write** access rights

Configuring a System - McnConfig Server 8000 Program

The MCN Config Server 8000 program is used to configure an MCN system. System configuration involves:

1. Defining system resources in the **Resource Windows**, such as Network Interfaces, Hardware Modules, Receiver Names and, Channels;

Designing the **Display Windows** to be displayed for the MCN Server and MCN Client programs;

Building a list of Display Windows (screens) available to the various Client PCs.

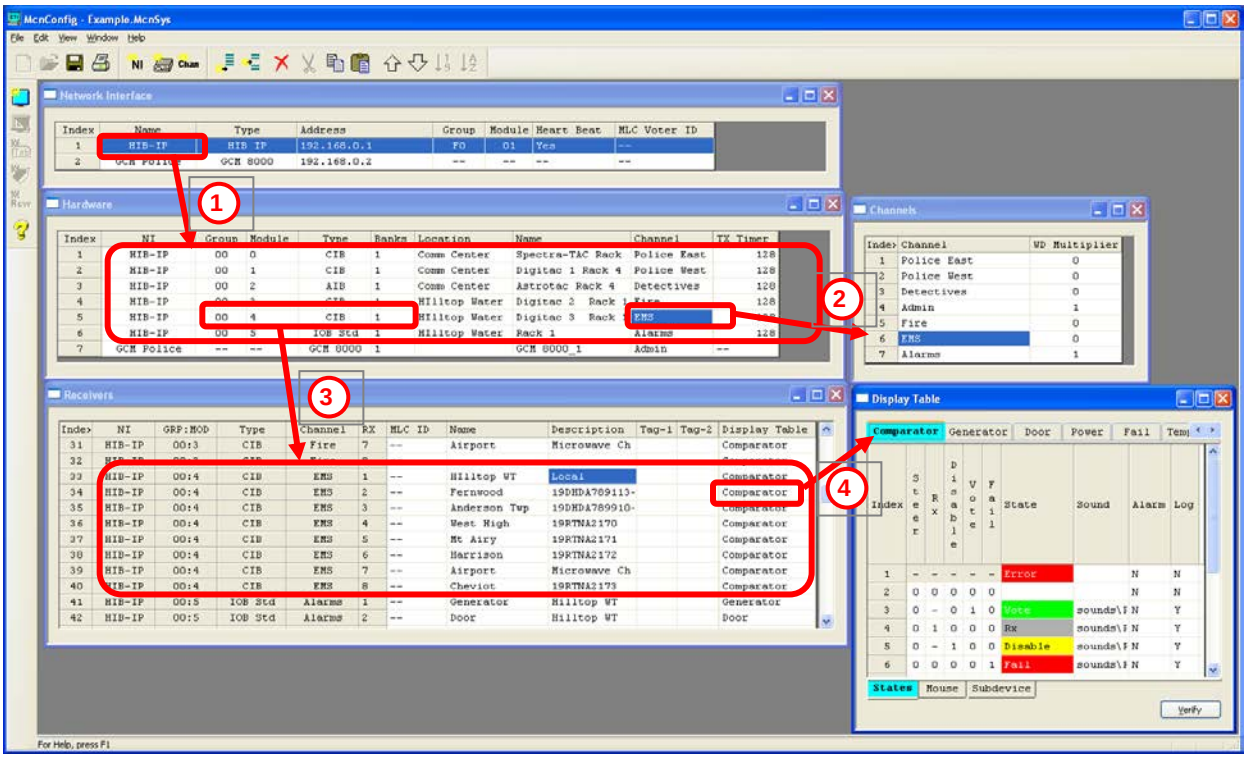
Resource Windows

The MCNConfig program will be used to define your system by entering data into the following Resource Windows. (There is only one of each type of Resource Window for each system.)

Network Interface	Indicates which Network Interface is used for this system. If you are using a HIB-IP unit, this is where you will enter the IP and MCN address settings. IP Comparators also have an entries in this window.
Hardware	Enter the information about the hardware modules (IP Comparators, CIBs, AIBs, IOBs, etc.) present in the system.
Receivers	Enter the site Names and Descriptions for all the receivers in the system.
Channels	Enter the names of the radio channels used in the system. Each channel can have multiple hardware modules.
Display Tables	Each type of device to be monitored and controlled will have a Display Table. The Display Table maps the hardware I/O bits of the device into status indications. The MCN Server software ships with standard Comparator Display Tables and a number of generic I/O Display Tables. Customized Display Tables can be created with special status text displays (On/Off, Alarm,, Run/Normal, etc.) for control and monitoring devices in your system.

Resource Table Links

Certain fields of the resource windows link to each other as shown by the arrows.



1. The Network Interface links to the devices connected to it that are shown in the Hardware window. In this example, the HIB-IP Network Interface has (6) MCN legacy modules connected to it: (4) CIB modules, (1) AIB module, and (1) IOB module.

   (The GCM 8000 Network Interface has just its GCM 8000 comparator linked under it.

2. Each Module in the Hardware Window can point to a Channel in the Channel window.
3. Each Module in the Hardware Window points to all the Receivers (subsites) or I/O points associated with it. In the example the CIB module points to its (8) receivers.

   An IP Comparator Module points to (64) receivers.

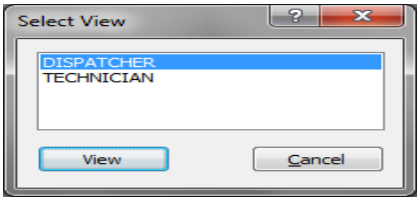
4. Each Receiver or I/O Point in the Receivers window points to a Display Table tab. This determines how the status information from the comparator or I/O module will be displayed.

Display Windows (Status Screens)

Display Windows are the screens that will be used to display the system status in the MCN Server and Client programs. You must build at least one Display Window in order for the MCN Server and Client programs to display your system.

- Each screen can have multiple rows and columns for the Receiver and I/O points.
- Each status screen can contain multiple Tabs and multiple channels.
- Multiple Screens can be defined within the Display window for the system.

If there are multiple screens built within the Display window, you will have to click the "**View**" tab and select "**Display Window**" and choose which specific screen you want to view.

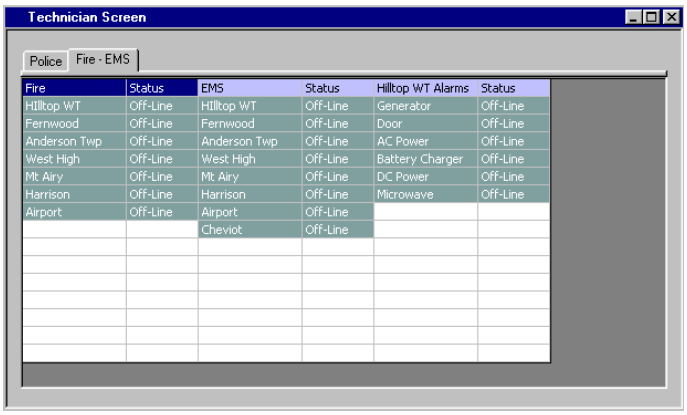


The following is an example of the Display Windows configurability:

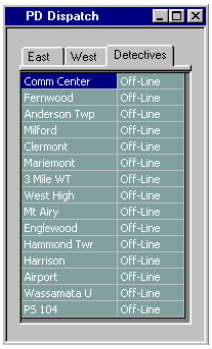
For Technicians, a large display grid with one tab showing all systems on a single grid.

For Dispatchers, a small grid with multiple tabs showing only one channel per tab.

Different Display Windows for different dispatchers with different subsets of channels available. (Police channels for Police dispatcher, Fire & EMS channels for Fire Dispatcher, etc.)



Typical Technician Display Window



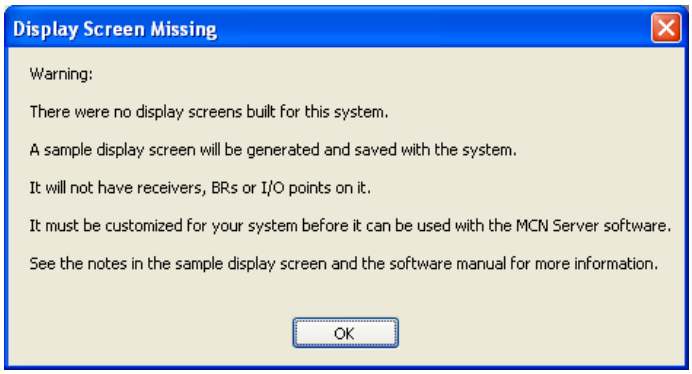
Typical Dispatcher Display Window

Example System

You can load an Example System from the "Example System" directory off the main program directory (typically c:\Program Files\CTI Products Inc\MCN Server 8000\Example System).

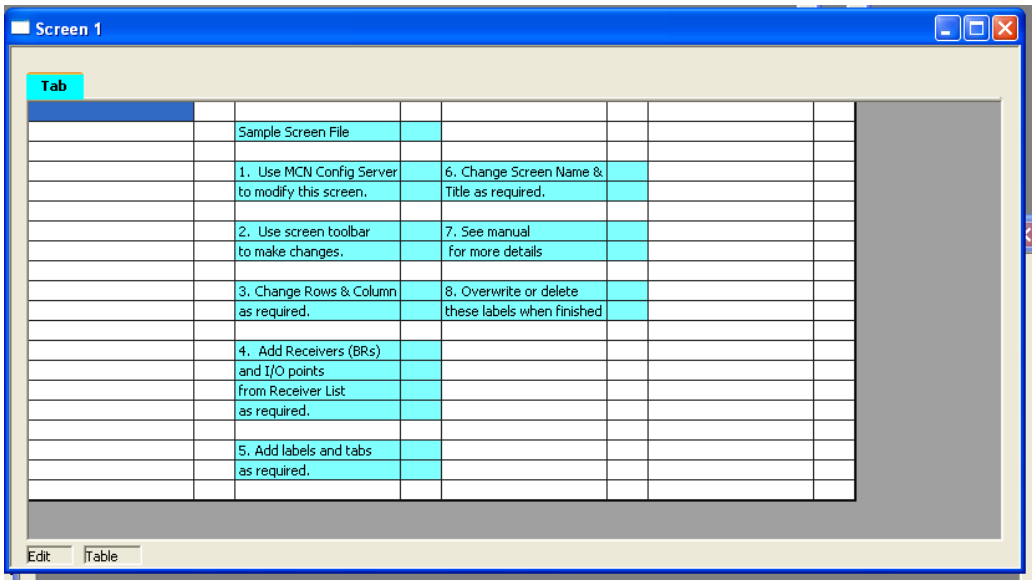
Default Display Window

If you forget to build a Display Window for your system, the MCN Config Server software will generate a warning.


Display Screen Missing
Warning:
There were no display screens built for this system.
A sample display screen will be generated and saved with the system.
It will not have receivers, BRs or I/O points on it.
It must be customized for your system before it can be used with the MCN Server software.
See the notes in the sample display screen and the software manual for more information.
OK

Missing Display Window Warning

The program will also generate a default Display Window. This will not have any receivers placed on it, but will give you instructions to remind you what needs to be done as shown below.


Screen 1
Tab
Sample Screen File
1. Use MCN Config Server to modify this screen.
2. Use screen toolbar to make changes.
3. Change Rows & Column as required.
4. Add Receivers (BRs) and I/O points from Receiver List as required.
5. Add labels and tabs as required.
6. Change Screen Name & Title as required.
7. See manual for more details
8. Overwrite or delete these labels when finished
Edit
Table

Default Display Screen

Navigating through MCNConfig Server

The MCNConfig program is a 32-Bit Windows program. Navigation, menus and toolbars are similar to other Windows programs.

Standard Windows **Hot-Keys** that can be used with this program include:

Ctrl-C	Copy current selection to clipboard
Ctrl-V	Paste clipboard to current location in selected window.

Context Sensitive Menus are available in different windows by Right-clicking an item.

Scroll Bars are available when the contents of a window (other than the main window) are larger than the size of that w0069ndow.

Controlling the Windows

You can have multiple windows (resource windows or display windows) open on the workspace at a given time. You can control the windows as follows:

View the Resource Windows (Hardware, Receivers, Channels, or Display Tables) or Display Windows with the **View** menu.

Select an open window by clicking the mouse on it or using the **Window** menu.

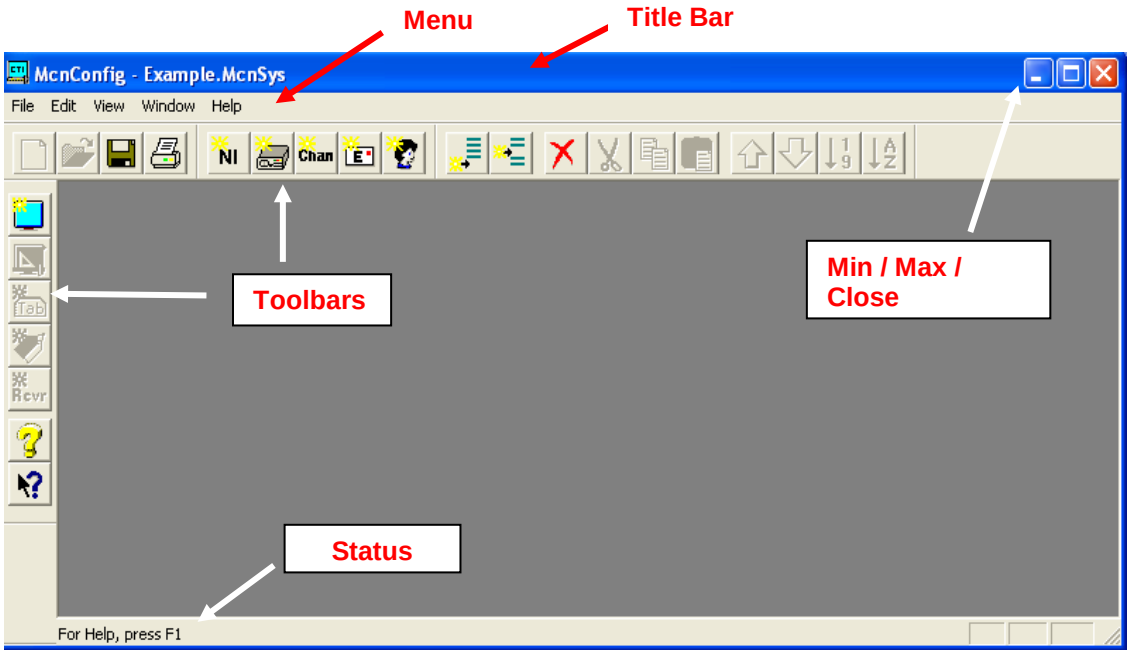
Move a window by grabbing its title bar and dragging it.

Re-size a window by grabbing an edge or corner and dragging it.

Minimize /Restore, Maximize and **Close** the window using the standard Windows buttons on the top right corner of each window. If you close the last window, you will close the system. If changes have been made, you will have a chance to save the system.

You can save the sizing and layout of your workspace by using the ***Save Layout*** command in the **Edit** menu.

Screen Elements



This program has many standard menu functions that are used in other Windows programs. For example, menus can be selected with the mouse or by holding down the ***ALT*** key while pressing the underlined letter on the menu. Note that a menu's appearance may change, and various menu options may be disabled, depending on the current state of the system.

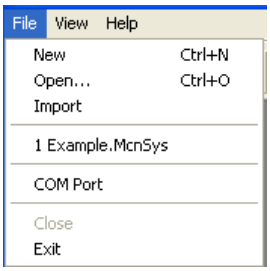
Menu Bar

Two versions of the Menu Bar will be displayed. When there is no system opened, a small Initial Menu Bar will be displayed:

When a system is loaded, the standard Menu Bar will be displayed:

Initial File Menu

When there is no system loaded, the Initial File Menu is available.



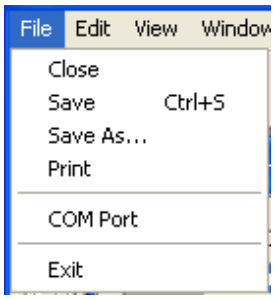
New Starts a new system from scratch.

Open Opens an existing system from disk. This will open all the files associated with a particular system. Only one system can be open at a given time. You must close the existing

	system before starting a new system, importing a system from the DOS version of MCNRCD , or opening another system.
Import	Imports a system from the DOS version of the MCNRCD program.
Recent Files	Allows you to quickly open a recently used system.
COM Port	Selects the COM port used to program HIB-IP units
Exit	Exits the program.

Standard File Menu

Once a system is loaded, the Standard File Menu is available:



Close	Closes the current system. If something has changed, you will be given a chance to save it.
Save	Saves the current system with the current name. This will save all the files associated with a particular system.
Save As	Saves the current system with a new name. This will save all the files associated with a particular system.
Print	Prints the contents of the currently selected window.
COM Port	Selects the COM port used to program HIB-IP units
Exit	Exits the program. If something has changed, you will be given a chance to save it.

The Standard File Menu does not have the Open, Import, or Recent Files menu items.

Saving Files

For security & information assurance purposes:

- Do not save the system configuration files in the program directory.
- Do not give Users the rights to modify or delete them

You will have to determine the appropriate directory in which to save your system configuration files. The access rights for the system configuration files will need to be:

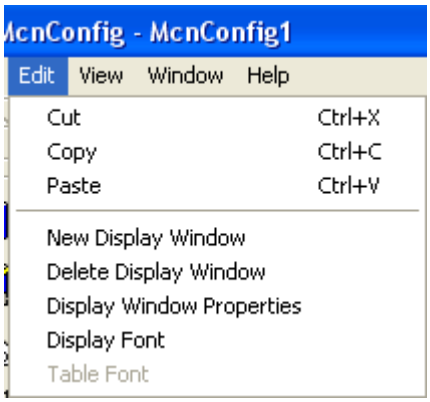
- Admin Full control
- User Read access

When you first save a system, Windows may default to the My Documents folder.
If so, browse to the appropriate directory and add a new directory for your system description files.

See the Windows Accounts section on page ***61*** for additional information.

Edit Menu

The **Edit** Menu is available whenever a system is loaded. Some menu items may not be enabled depending on the currently active window.



Cut — Cuts the selected item(s) and saves a copy in the clipboard.

Copy — Copies the selected item(s) to the clipboard.

Paste — Pastes the contents of the clipboard to the current cursor location. Some fields are special fields that accept only certain data (or certain ranges of data) from the clipboard. See ***Restrictions on Using the Clipboard*** on page ***117*** for more details.

New Display Window — Opens a new MCN Display Window.

Delete Display Window — Deletes an MCN Display Window.

Display Window Properties — Sets the properties (Window Title, Number of Rows & Columns) for the currently selected MCN Display Window.

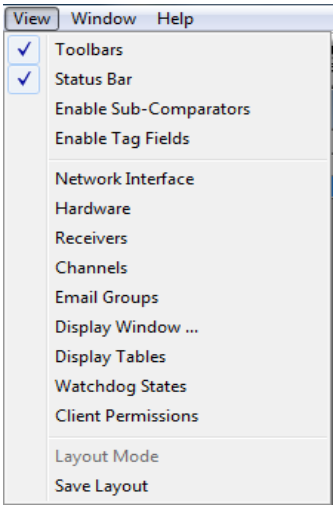
Display Font — Only available to set the font and size of text within the Display Window; Used to simulate the display for the MCN Server program.

Table Font — Sets the font and size of text within currently opened, active windows. Not active in the Display Window.

Any font settings made from here are only effective within MCN Config program. The font settings for the MCN Server programs (and the MCN Client program) are set by the user from within those programs.

View Menu

The **View** Menu is used to display a list of available windows, from which you may quickly select and make active for use. Some items will only appear when certain options are purchased with the License.

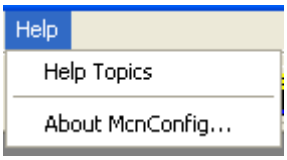


Toolbars	Turns the Toolbars on or off.
Status Bar	Turns the Status Bar (at the bottom of the screen) on or off.
Enable Sub-Comparators	Displays a tab for Sub-comparator fields and options in the Display Table and Receiver Window. Sub-comparator features are normally not used with IP comparators. Turn this off for a less cluttered screen view if sub-comparators are not used.
Enable Tag Fields	Displays a column of Tag fields in the Receiver Window. Tag fields may be used to store general-purpose information.
Network Interface	Opens the Network Interface Window and makes it active.
Hardware	Opens the Hardware Resource Window and makes it active
Receivers	Opens the Receiver Resource Window and makes it active.
Channels	Opens the Channel Resource Window and makes it active.
Display Window	Opens an RCD (Remote Comparator Display) Display Window and makes it active.
Display Tables	Opens the Display Tables Window and makes it active.
Watchdog States	Opens the Watchdog States window and makes it active. (This is to support the System Performance Toolkit option that is not currently offered.)
Client Permissions	Opens the Client Permission Window and makes it active.
Layout Mode	Turns on Layout Mode in a Display Window to enable re-sizing of columns (active only when a Display Window is active.)
Save Layout	Saves the current working screen layout (Window Positions, Column widths). This layout will be used the next time the program is started.

Window Menu

Cascade	Cascades all open windows
Tile	Tiles all open windows
Window List (1-N)	Indicates currently open windows. Use this list to select and open a Resource (Network Interface, Hardware, Receivers, Channels and Display Table) or Display window. The Resource Windows will appear in the order they were opened. Display Windows will be listed as named by the user. (Windows 6 & 7 in this screen shot are Display Windows.)

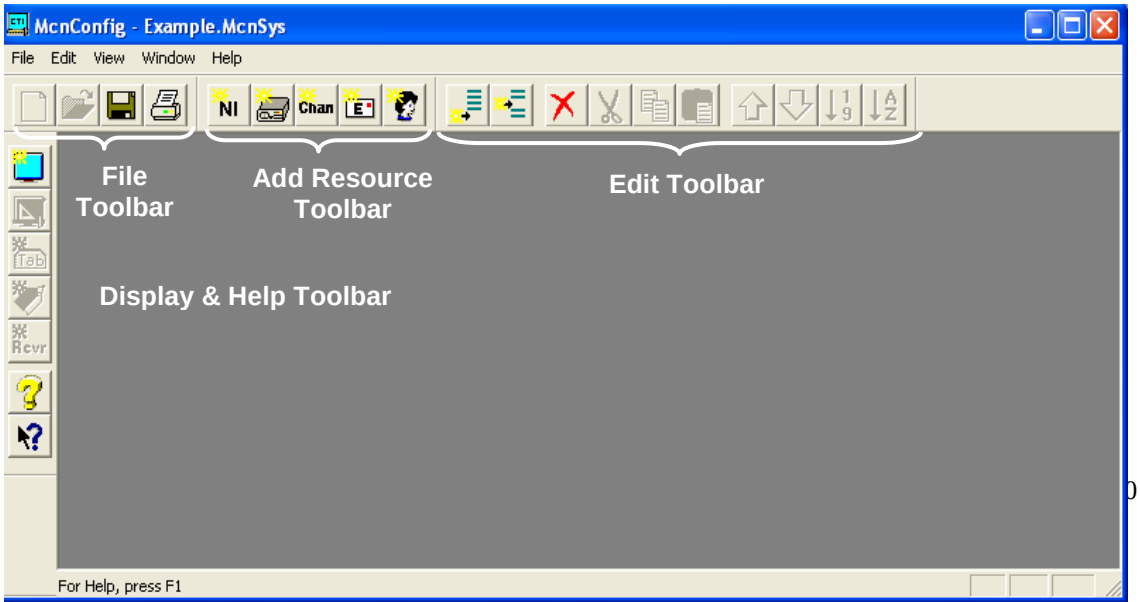
Help Menu



Help Topics	Brings up the software manual. Adobe Reader must be installed to support this option.
About MCNConfig	Displays information about the program

Toolbars

The MCNConfig program has dockable toolbars indicated in the screen capture below. You can move the toolbars by clicking on the beginning or ending line in the toolbar and dragging it to the desired



location.

Each Toolbar button has a Tool Tip that will be displayed when you hover the mouse over it. A more lengthy description of the button will appear in the Status Line at the bottom of the main window.

File Toolbar

New Opens a new system.
Same as **File … New** menu item.

Open Opens a system from disk.
Same as **File … Open** menu item.

Save Saves the current system to disk.
Same as **File … Save** menu item.

Print Prints the data from the active window.
Same as **File … Print** menu item.

Add Resource Toolbar

New Network Interface Module
Adds a new Network Interface module or IP Comparator to the Network Interface resource window. The quantity of Network Interfaces or IP comparators that can be used with the system will be limited by the Software License File.

New Module Adds a new module to the Hardware List resource window. Adds the appropriate number of Receivers or I/O Blocks in the Receiver window.

New Channel Adds a new channel to the Channel List resource window.

Edit Toolbar

Items in the Edit Toolbar work only in the currently selected window. If a toolbar item is not available in a particular window, it will be grayed out.

Append Adds a new item to the end of a list of items. This item is not available in the Receiver Window or Display Window.

Insert Inserts a new item at the current location in a list of items. This item is not available in the Receiver Window or Display Window.

Delete Deletes the currently selected item(s).

Cut Deletes the currently selected item(s) and copies them to the clipboard.

Copy Copies the currently selected item(s) to the clipboard without deleting them from the selected window.

Paste Pastes the clipboard contents to the current location in the selected window: See Preceding **Note**.

Move Up Moves up the currently selected item in the list. This item is only available in the Channel Window.

Move Down Moves down the currently selected item in the list. This item is only available in the Channel Window.

Sort Alpha Sorts the list alphabetically. This item is available only in the Channel Window.

Display & Help Toolbar

New Display Adds a new display window.

Display Window Properties
Opens the Grid Properties dialog box. Allows changes to be made to the window Title, and the number of rows and columns for a Display Window. This item is available only when a Display Window is selected.

New Tab Appends a display tab to the selected Display Window. This item is available only when a Display Window is selected.

New Label Adds a Label at the current position in the selected Display Window. This item is available only when a Display Window is selected.

New Receiver Adds Receiver(s) or I/O Group(s) to the current position in the selected Display Window. This item is available only when a Display Window is selected.

Help Displays the Help menu window.

.

Configuring System Resources

The first step in configuring a system is configuring the Resources in the four Resource Windows:

Network Interface Window

Add **IP Comparators** and configure their IP parameters,

.

Add **HIB-IP Network Interfaces** (for legacy MCN systems), configure their parameters, and program the HIB-IP units,

Display other MCN Legacy Network Interface(s) (**PCLTA**, or **HIB-232** modules if used).

Hardware Window

Enter additional information for IP Comparators,

Add Legacy MCN comparator (CIB & AIB) modules and I/O Modules and configure their MCN addresses.

Receiver Window

Enter the receiver names & I/O group names and other data for all hardware modules.

Channel Window

Enter radio channel names.

The individual resource windows and configuration instructions are in the following sections.

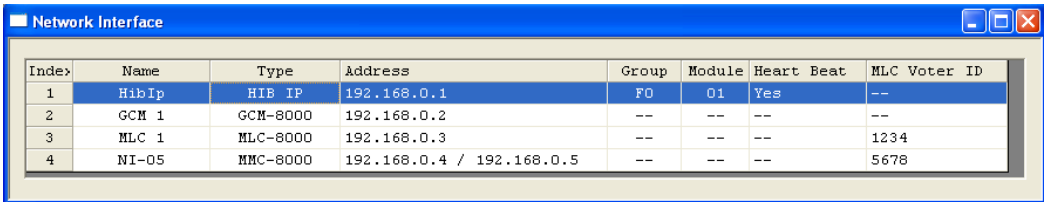
Adding IP Comparators & Network Interfaces - Network Interface Window

This window displays the following items configured for this system:

- IP Comparator IP configuration data
- Legacy MCN Network Interfaces (HIB-IP, PCLTA and HIB-232 modules)

From this window, you can also configure the IP settings for a HIB-IP module (if used).

The number of IP comparators and legacy Network Interfaces that can be used by the system are controlled by the software key file.



Index	Name	Type	Address	Group	Module	Heart Beat	MLC Voter ID
1	HibIp	HIB IP	192.168.0.1	F0	01	Yes	--
2	GCM 1	GCM-8000	192.168.0.2	--	--	--	--
3	MLC 1	MLC-8000	192.168.0.3	--	--	--	1234
4	NI-05	MMC-8000	192.168.0.4 / 192.168.0.5	--	--	--	5678

- The legacy Network Interfaces (HIB-IP, PCLTA) can connect to multiple legacy MCN hardware modules (such as CIB, AIB and GPIO modules).
- The GCM 8000 and MLC 8000 Analog Comparator Network Interface entries are each associated with one comparator.
- The MM Mixed Mode Network Interface is associated with both a GCM 8000 and an MLC 8000 Analog Comparator.

The Network Interface Resource Window includes the following fields:

Name
This field holds the name of:

- Legacy Network Interface (HIB-IP, PCLTA, HIB-232)
- GCM 8000 or MLC 8000 Analog Comparator IP Comparator
- Mixed Mode Comparator (Since the Mixed Mode comparator is made up of a GCM 8000 and MLC 8000 Analog Comparator, it appears in this window on a single line with two IP addresses.)

Type
This field indicates the type of Network Interface Module:

- **GCM 8000** GCM 8000 Comparator
- **MLC 8000** MLC 8000 Analog Comparator
- **Mixed Mode** Mixed Mode Comparator (GCM 8000 and MLC 8000 Analog Comparator pair)
- HIB **IP** HIB-IP Network Interface
- **Non-IP** Legacy PCLTA or HIB-232 Network Interface

The settings for the IP Network Interfaces (IP Comparators and HIB-IP) are set up in the MCNConfig program and saved in the system files for the MCN system. You will also use the settings stored in the system files to program the HIB-IP unit (through a COM port).

The settings for Non-IP Network Interfaces are set up with the HWSetup program and stored in the PC registry. The MCN Server program will get that information from the registry when it runs.

Address
This field is used for:

- IP Devices — IP Address(es)
  Mixed Mode comparators have (2) IP addresses
  Address 1: MLC 8000 Comparator IP Address
  Address 2: GCM 8000 IP Address
- Non-IP Network Interfaces (PCLTAs or HIB-232s)
  This is a pointer to the Non-IP Network Interface that is set up with the HWSetup program. It will normally be "MCN1".

Group
MCN Group Number for this module (Hex value 00-FE)
This is shown only for HIB-IP units (which are configured in MCNConfig program).

Module
MCN Module Number for this module (Hex value 0-F)
This is shown only for HIB-IP units (which are configured in MCNConfig program).

Heart Beat
This is for legacy Network Interfaces only. It is used to control the heartbeat from the server to the legacy MCN modules. This field should normally be set to **"Yes".**

In systems with multiple servers that all access the same legacy modules, it may be advisable to set all but one of the servers to **"No".** If you have such a system, contact a CTI Products engineer for assistance.

MLC Voter ID

This is the Voter ID for MLC 8000 Analog Comparators. It is also used in Mixed Mode systems (since Mixed Mode systems include an MLC 8000 Analog Comparator). This field is found in the MMC_Cfg.csv file generated by the MLC 8000 Analog Comparator CT program. See MLC 8000 Analog Comparator Interfacing on page ***44*** for details.

Adding IP Comparators

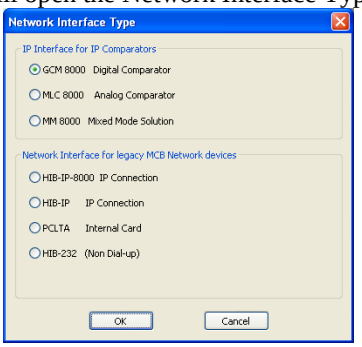
The IP comparators appear in two windows:

- Network Interface Window and
- Hardware Window.

IP comparators can be added from either window using the right-click menu or the toolbar.

Method 1: From the **Network Interface window**, either:

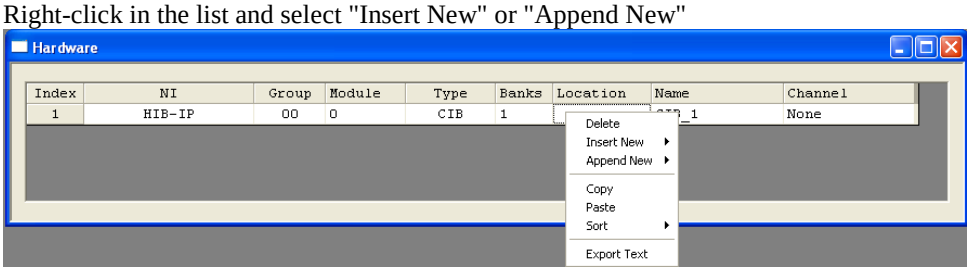
- Right-click in the list and select "Add New" or
- Select the **Add NI or IP Comparator** icon from the toolbar:
- Either method will open the Network Interface Type window:



- Select the appropriate type of comparator and hit OK.

Method 2: From the **Hardware window**, either:

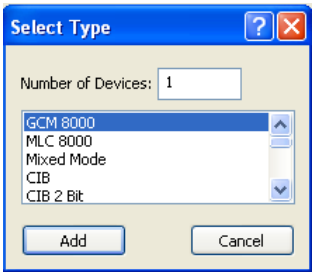
- Right-click in the list and select "Insert New" or "Append New"



or

- Select the **Add Module** icon from the toolbar:

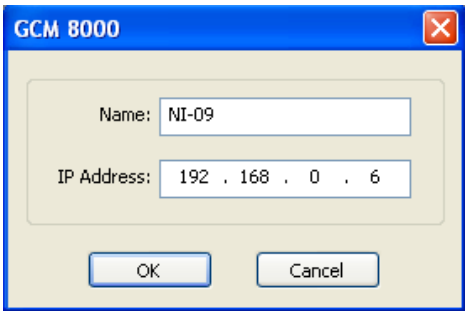
- Either of the above steps will open the Select Type list:



- Select the appropriate type and hit "Add".

Adding a GCM 8000 Comparator

When you have selected a GCM 8000 comparator by one of the above methods, the GCM 8000 configuration window is opened.

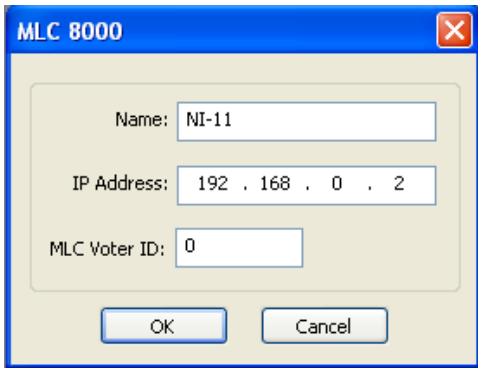


This configuration is the Network Interface portion of the GCM 8000 comparator.

- The program will automatically assign a sequential name starting with the prefix NI (Network Interface). You can change it to whatever you want.
- The program will pick an IP address in the 192.168.x.x. range.
  Edit the IP Address for the proper address of the GCM 8000 comparator.

Adding an MLC 8000 Analog Comparator

When you have selected an MLC 8000 Analog Comparator by one of the above methods, the MLC 8000 configuration window is opened.



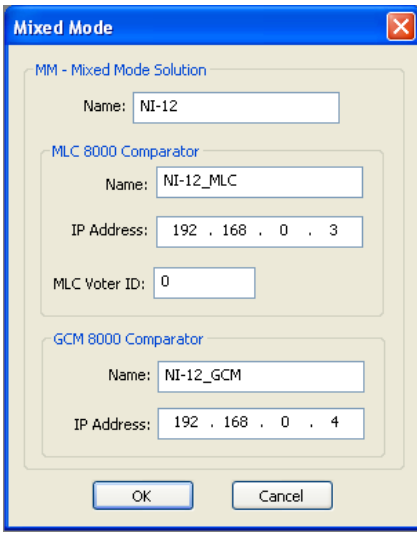
This configuration is the Network Interface and Voter ID portion of the MLC 8000 Analog Comparator.

- The program will automatically assign a sequential name starting with the prefix NI (Network Interface). You can change it to whatever you want.
- The program will pick an IP address in the 192.168.x.x. range.
  Edit the IP Address for the proper address of the MLC 8000 Analog Comparator.
- Add the proper MLC Voter ID. The Voter ID can be found in the MMC_config.csv file and the MLC 8000 Analog Comparator CT software. See the MLC 8000 Analog Comparator Interfacing section starting on page ***44*** for details.

Adding a Mixed Mode comparator system.

Mixed-Mode comparator solutions use a GCM 8000 digital comparator and an MLC 8000 Analog Comparator working together. The MCN Server 8000 takes data from each and consolidates it into a composite device.

When you add a Mixed Mode comparator, the Mixed Mode configuration window is opened. This window has parameters for the composite Network Interface entry and the two comparators:

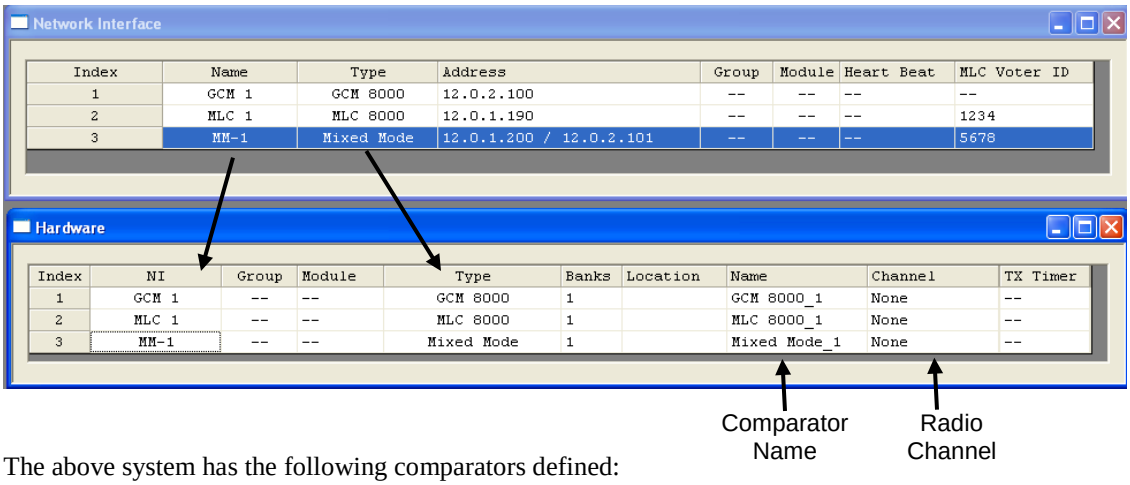


- The program will automatically assign a sequential **Name** starting with the prefix NI (Network Interface) for the consolidated Network Interface. You can change it as appropriate.
- The program assigns an MLC-8000 comparator **Name**. This name will be seen in the Hardware window. You can change it as appropriate
- The program will pick an IP address in the 192.168.x.x. range for the MLC 8000 Analog Comparator. Edit the IP Address for the proper address of the MLC 8000 Analog Comparator.
- Add the proper MLC Voter ID. The Voter ID can be found in the MMC_config.csv file and the MLC 8000 Analog Comparator CT software. See the MLC 8000 Analog Comparator Interfacing section starting on page ***44*** for details.
- The program assigns a GCM-8000 comparator **Name**. This name will be seen in the Hardware window. You can change it as appropriate
- The program will pick an IP address in the 192.168.x.x. range for the GCM 8000 comparator. Edit the IP Address for the proper address of the GCM 8000 comparator.

IP Comparator Representation in the NI and Hardware Windows

The configuration information for the IP comparators is displayed in the NI Network Interface window and the Hardware window as shown below:

The NI Name and Type fields from the Network Interface window as shown by the arrows.


Network Interface
Index | Name | Type | Address | Group | Module | Heart Beat | MLC Voter ID
1 | GCM 1 | GCM 8000 | 12.0.2.100 | -- | -- | -- | --
2 | MLC 1 | MLC 8000 | 12.0.1.190 | -- | -- | -- | 1234
3 | MM-1 | Mixed Mode | 12.0.1.200 / 12.0.2.101 | -- | -- | -- | 5678
Hardware
Index | NI | Group | Module | Type | Banks | Location | Name | Channel | TX Timer
1 | GCM 1 | -- | -- | GCM 8000 | 1 | | GCM 8000_1 | None | --
2 | MLC 1 | -- | -- | MLC 8000 | 1 | | MLC 8000_1 | None | --
3 | MM-1 | -- | -- | Mixed Mode | 1 | | Mixed Mode_1 | None | --
Comparator Name
Radio Channel

The above system has the following comparators defined:

- GCM 8000 Stand-alone
- MLC 8000 Analog Comparator Stand-alone
- MM Mixed Mode (MLC 8000 Analog Comparator & GCM 8000

The system will be connected to (4) physical comparators:

- (2) GCM 8000 comparators and
- (2) MLC 8000 Analog Comparators

However, we see only (3) comparators are shown in the Hardware window:

- Each of the stand-alone comparators has its own line.
- The Mixed Mode system appears as one line in the hardware window.

The Mixed Mode entry in the Network Interface window ties together the two comparators used in the Mixed Mode system (with the dual IP addresses and the MLC ID). The MCN Server 8000 software will communicate with both in the Mixed Mode system (as defined in the Network Interface window) and combine them as one logical Mixed Mode comparator.

Additionally, the Receivers (or BRs) for each of the comparators will be configured in the Receiver window (see the Adding Receiver Data - Receivers Resource Window section on page ***94*** for details). Each of the three comparators in the Hardware window will have 64 receiver slots assigned to it in the Receivers window. For the Mixed Mode solution, the status data from the digital GCM 8000 and the analog MLC 8000 Analog Comparators will be combined and directed to one receiver display for each Receiver/BR in the Mixed Mode system.

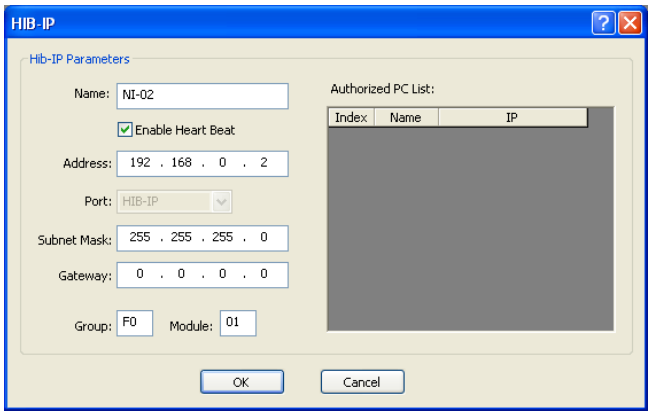
If you don't have any HIB-IPs in your system, skip ahead to the Configuring the Hardware - Hardware Resource Window section on page ***88*** .

Adding a Network Interface – HIB-IP

Note: If you are not using HIB-IP modules in this system, skip this section and go to ***Configuring the Hardware - Hardware Resource Window*** Page ***88***.

When you start to build a new system, the MCNConfig program will look in the registry to determine which Network Interface you have selected. If you have set up a Non-IP Network Interface (such as a PCLTA, or a Non-Dial-Up HIB-232) in the HWSetup program, the MCNConfig program will find it and select it as the Network Interface for this system.

If you have selected a HIB-IP in the HW Setup program, the MCNConfig program will open the Network Interface Properties window.



Enter the appropriate parameters for the HIB-IP unit:

Name

Give a name to the HIB-IP unit. This is the name that you will refer to when you add hardware modules to the system.

Enable Heartbeat

This enables the heartbeat sent to the legacy MCN modules. It may be disabled on all but one PC if you have multiple PCs communication with the MCN network should be checked on one server in the system. If you have multiple serve

Address

Enter a valid Class A, B, or C IP address for this unit.
See details in the HIB-IP Hardware Reference Manual.

Subnet Mask

Enter the Subnet Mask for this IP address.
See details in the HIB-IP Hardware Reference Manual.

The HIB-IP Subnet Mask **cannot be less restrictive** than the following standard IP Class Subnet Masks

Class	First Octet	Standard Subnet Size	Standard Subnet Mask
A	1-127	16,777,214	255.0.0.0
B	128-191	65,543	255.255.0.0
C	192-223	253	255.255.255.0
D	224-239	Multicast – Do not use.	
E	240-255	Experimental – Do not use.	

The HIB-IP units can accept a subnet mask that is more restrictive (more 1's set in the Subnet Mask), but not less restrictive.

Gateway

If the MCN Server PC will be using an IP address that is in a different subnet than the HIB-IP, you must enter a Gateway IP address. This is the IP address of the IP router that the HIB-IP will communicate to in order to talk to a PC that is on a different IP subnet. The Gateway IP address must be on the same subnet as the HIB-IP unit.

If the MCN Server PC and the HIB-IP are on the same subnet, you do not have to enter a Gateway address.

See details in the HIB-IP Hardware Reference Manual.

Group

MCN Group address for the HIB-IP.

Value: 00-FE Hex
See Warning under ***Important: MCN Address Setting*** on Page ***33***.

Module

MCN Module address for PCLTAs and HIB-IP units.

Value: 00-7E Hex Usually a HIB-IP will be set for a module number of 10 hex or above. This leaves room for HIB-232 modules in the system, which are limited to Module Numbers 0-F.

MCN Group & Module Settings

Note: All Network Interfaces and MCN modules must have unique addresses.

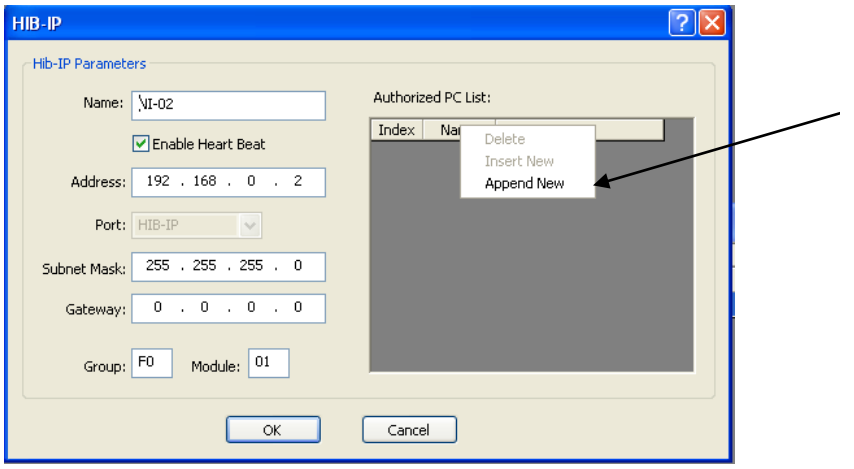
In addition, in Custom-Engineered systems with Routers and EXB Network Extenders, there may be specific Group & Module addresses that must be used with particular Network Interfaces, depending on their location in the MCN network.

If you have a Custom Engineered System, be sure to consult your custom system configuration documentation for the proper setting for the Group & Module addresses for your Network Interfaces.

HIB-IP Authorized PCs

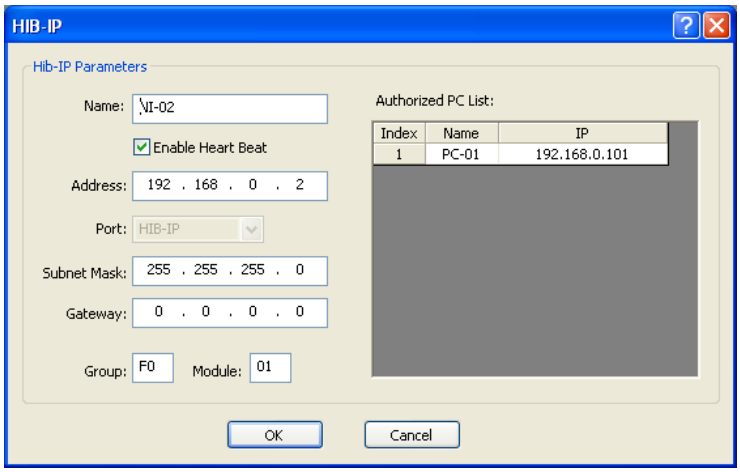
For system security purposes, the HIB-IP will communicate only with Authorized PCs Authorized Servers). You may enter multiple IP addresses for Authorized PCs.

To add an Authorized PC, **Right-Click** on the Authorized PCs list to bring up the menu.

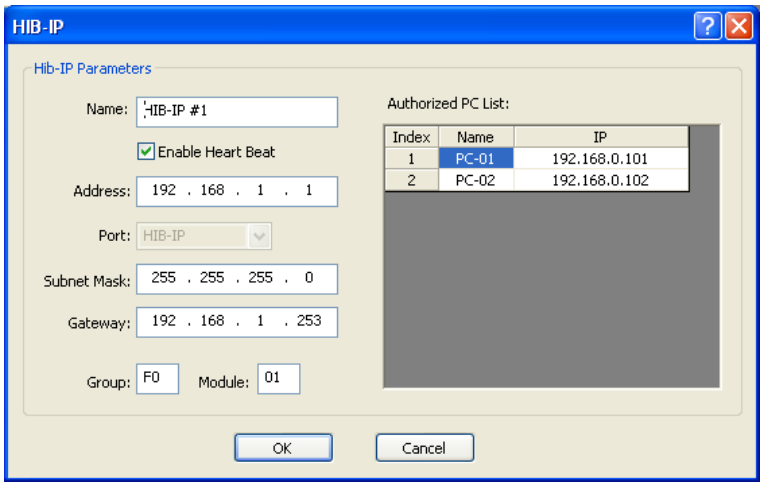


Right-Click here to add an Authorized PC.

Select **Append New**.



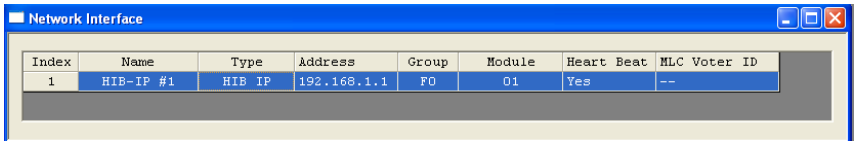
- A new PC will be entered.
- Edit the PC Name (if desired).
- Edit the IP settings to match the PC you plan to use.
- You can add additional Authorized PCs by right-clicking in the Authorized PC list.



- Set up the parameters for the HIB-IP unit.
- When you are finished entering Authorized PCs, click the **OK** button.

Although you can enter multiple Authorized PCs in the HIB-IP configuration window, the HIB-IP can only connect to one PC at a time. If a second PC attempts to connect to a HIB-IP at the same time (even if it is in its Authorized PC list), it will be rejected.

The HIB-IP unit will appear in the Network Interface window.

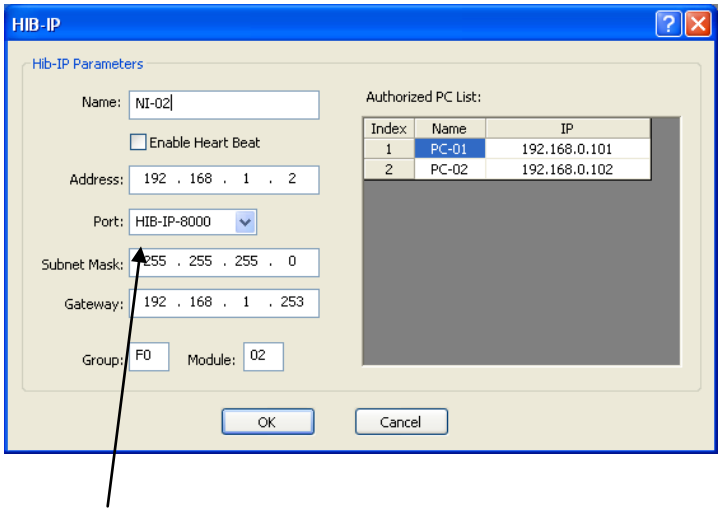


It will then be associated with all the hardware modules (such as CIBs, AIBs, and IOBs).

The standard MCN Server 8000 software supports (4) IP comparators and (1) HIB-IP.
(Support for additional IP Comparators or HIB-IP Network Interfaces, may be added with additional license expansion options.

Adding a Network Interface – HIB-IP 8000

Adding a HIB-IP 8000 is similar to adding a legacy HIB-IP unit. The difference is shown in the HIB-IP configuration window below:



Port

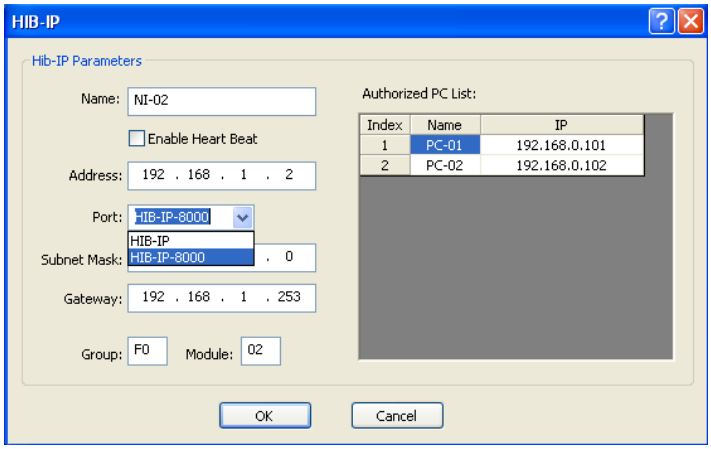
Whereas the legacy HIB-IP units have fixed destination UDP Port numbers, the HIB-IP 8000 units have a selectable destination Port ID. This enables them to be used in wide area networks that use specific UDP Port addresses for filtering.

Current selections are:

-
- HIB-IP For Legacy support or
- HIB-IP 8000 To support MSI Astro™25 RNI Version 7.13 and up

User-defined port numbers will be available in a future release.

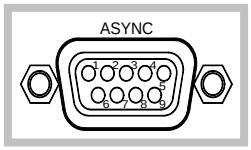
Select the appropriate port for your application



Programming HIB-IP and HIB-IP 8000 Units

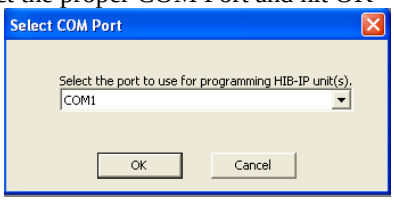
You must use MCNConfig program to download the parameters to the HIB-IP unit before you can use it.

1. Be sure all the HIB-IP and Authorized PC parameters have been entered into the PC system configuration files as described above
2. IP traffic can interrupt programming or viewing the data on a HIB-IP unit. Remove IP traffic by disconnecting the Ethernet cable from the 10Base-T port on the rear of the HIB-IP unit.
3. Connect a Null Modem cable (CTI # 89-11314) between the PC and the Async Serial Programming connector on the HIB-IP. Use of different cables may result in inconsistent or improper programming and viewing of HIB-IP data. See the HIB-IP manual for the cable pinout.



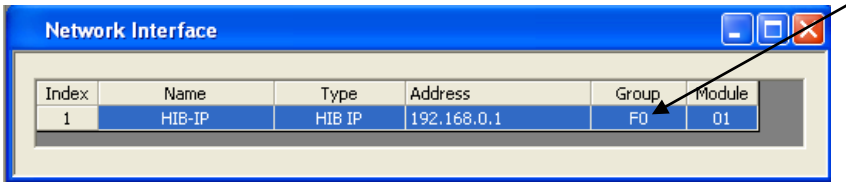
4. Go the File menu and select COM Port:

5. Select the proper COM Port and hit OK

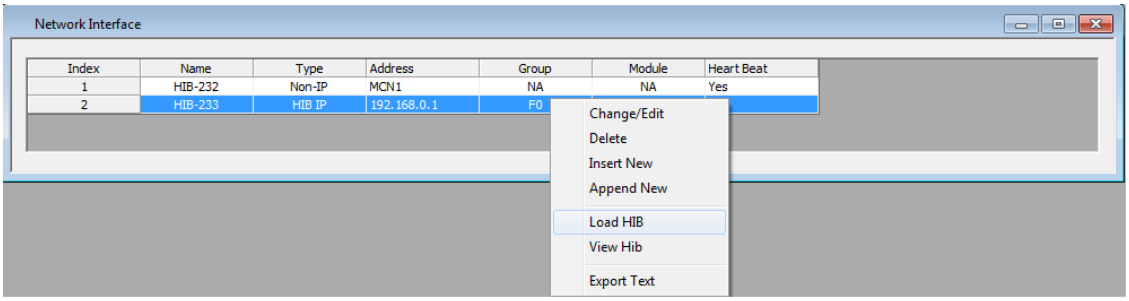


.

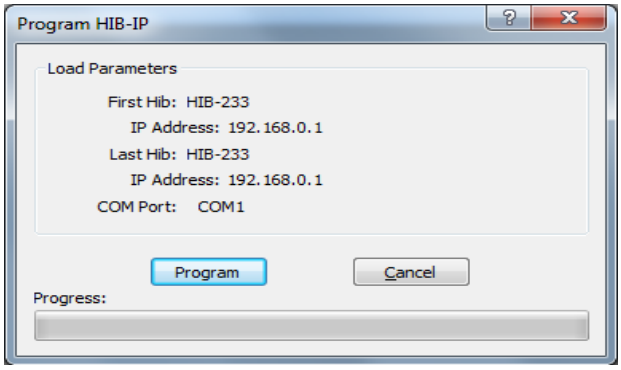
6. Go to the Network Interfaces window and select the proper HIB-IP unit.



7. Right-click on the HIB-IP unit and select "Load HIB" from the pop-up window.



8. From the Program HIB-IP window, click the "Program" button.



9. You can also read or verify the information in the HIB-IP by selecting the "View HIB" menu item from the previous pop up window. This will read and display the configuration data within the HIB-IP unit.
10. Re-connect the Ethernet cable to the 10BASE-T port on the read of the unit..

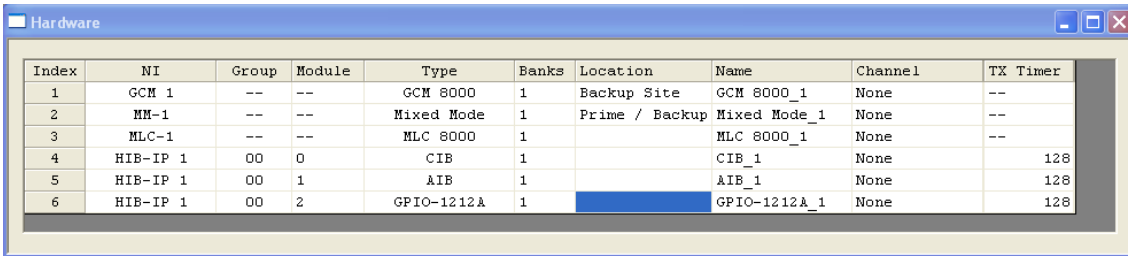
Refer to the HIB-IP Hardware Reference Manual S2-61173 for additional details on HIB-IP Set up and Installation.

Configuring the Hardware - Hardware Resource Window

After you have added the appropriate Network Interfaces, go to the Hardware resource window to add and edit the data for various Hardware Modules.

To get to the Hardware window, select **View / Hardware** from the program menu.

The Hardware window will show a list of IP Comparators and legacy MCN hardware I/O modules in the system.



Index	NI	Group	Module	Type	Banks	Location	Name	Channel	TX Timer
1	GCM 1	--	--	GCM 8000	1	Backup Site	GCM 8000_1	None	--
2	MM-1	--	--	Mixed Mode	1	Prime / Backup	Mixed Mode_1	None	--
3	MLC-1	--	--	MLC 8000	1		MLC 8000_1	None	--
4	HIB-IP 1	00	0	CIB	1		CIB_1	None	128
5	HIB-IP 1	00	1	AIB	1		AIB_1	None	128
6	HIB-IP 1	00	2	GPIO-1212A	1		GPIO-1212A_1	None	128

From this window, you can:

- Add legacy MCN hardware I/O modules (CIB, AIB, GPIO modules, etc.)
- Edit the configuration data for either IP comparators or the legacy MCN hardware modules.

The Hardware Resource Window includes the following fields:

NI
Network Interface to use for this module.

IP Comparators: This is a fixed field derived from the Network Interface window.

Legacy MCN Modules: This is a drop-down field that will let you select from the defined Network Interfaces for this system (PCLTA, HIB-232, or HIB-IP) to use for this MCN hardware module.

Group

IP Comparators: Not applicable

Legacy MCN Modules: MCN Group Number for this module (Hex value 00-FE)
This corresponds to the Group switch setting on the module.

Module

IP Comparators: Not applicable

Legacy MCN Modules: MCN Module Number for this module (Hex value 0-F)
This corresponds to the Module switch setting on the module.

Type
Module Type from the following table:

Module Type	Description	Receivers or I/O Blocks
GCM 8000	GCM 8000 Digital Comparator	64 Receivers
MLC 8000	MLC 8000 Analog Comparator	64 Receivers
Mixed Mode	Mixed Mode Comparator system (MLC & GCM)	32 Receivers
CIB	Comparator Interface	8
AIB	Astrotac Comparator Interface	8, 16, 24, 32, 40, 48, 56, 64 (Depending on Bank setting)
GPIO	General Purpose I/O Module	8, 12, 16, 20, or 24, depending on exact module type
IOB Std (4 bits each)	I/O Controller for relays	8 I/O Blocks
IOB 2 Bit (2 bits each)	I/O Controller for relays	16 I/O Blocks
IOB 1 Bit (1 bit each)	I/O Controller for relays	32 Input Blocks

Banks
For AIB modules, this indicates the number of receiver banks (8 receivers per bank). AIB modules can have up to 8 banks. All other modules have only 1 bank. A drop-down list is provided.

Location
Typically refers to site name for this particular module.

Free format text field for customer use.
This field is not required for program operation.
Can be used in error logging.

Name
Typically used to identify a particular module.

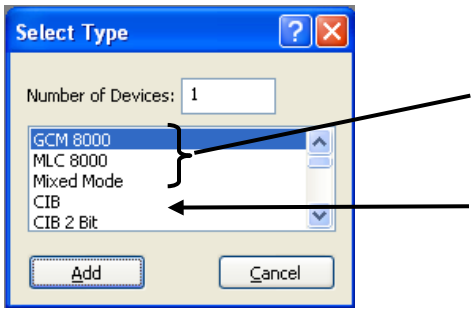
Free format text field for customer use.
This field is not required for program operation.
Used in error logging.

Channel
The radio channel associated with this module.

Drop-down field.
Select one of the Channels from the Channel resource list.
Can be used in error logging.

Adding a Hardware Module

Add new hardware module with the **New Module** button.

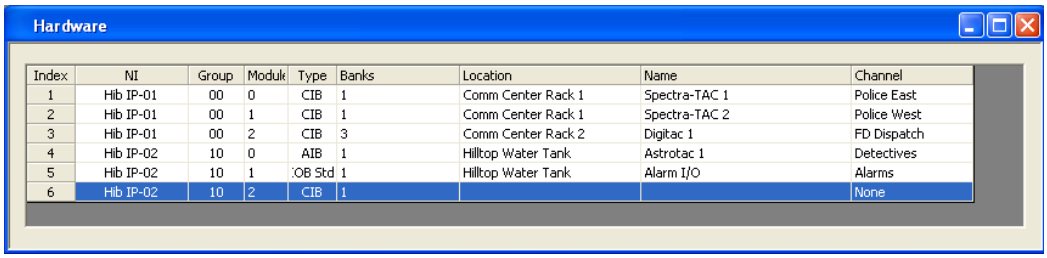


The first three entries are IP comparators. You can add them here, too. The program will then add the entries in the Network Interface window and the Hardware window.

The legacy MCN modules appear in the list below the IP comparators.

Select a Hardware Type and hit Add.

A new hardware module will be added to the bottom of the list. It will have the next Group & Module number.



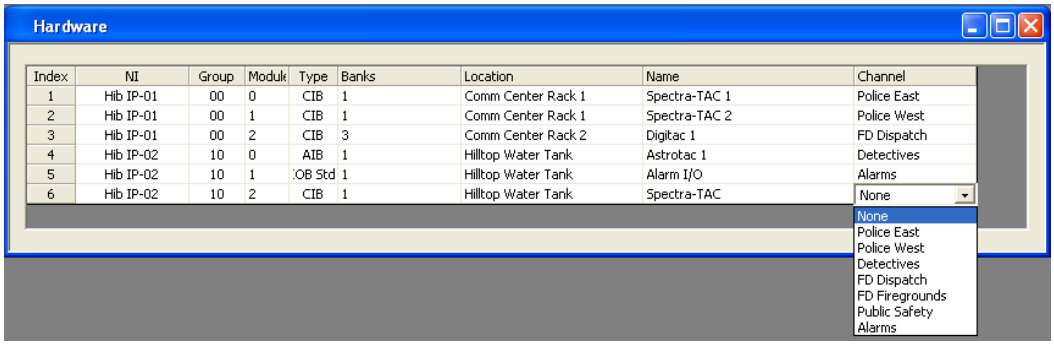
Index	NI	Group	Module	Type	Banks	Location	Name	Channel
1	Hib IP-01	00	0	CIB	1	Comm Center Rack 1	Spectra-TAC 1	Police East
2	Hib IP-01	00	1	CIB	1	Comm Center Rack 1	Spectra-TAC 2	Police West
3	Hib IP-01	00	2	CIB	3	Comm Center Rack 2	Digitac 1	FD Dispatch
4	Hib IP-02	10	0	AIB	1	Hilltop Water Tank	Astrotac 1	Detectives
5	Hib IP-02	10	1	OB Std	1	Hilltop Water Tank	Alarm I/O	Alarms
6	Hib IP-02	10	2	CIB	1			None

For legacy MCN modules, if you have more than one legacy Network Interface, select the proper one for this module.

If this is an AIB module, enter the proper number of banks.

Enter the Location and Name.

Select a Channel from the drop--down menu



Index	NI	Group	Module	Type	Banks	Location	Name	Channel
1	Hib IP-01	00	0	CIB	1	Comm Center Rack 1	Spectra-TAC 1	Police East
2	Hib IP-01	00	1	CIB	1	Comm Center Rack 1	Spectra-TAC 2	Police West
3	Hib IP-01	00	2	CIB	3	Comm Center Rack 2	Digitac 1	FD Dispatch
4	Hib IP-02	10	0	AIB	1	Hilltop Water Tank	Astrotac 1	Detectives
5	Hib IP-02	10	1	OB Std	1	Hilltop Water Tank	Alarm I/O	Alarms
6	Hib IP-02	10	2	CIB	1	Hilltop Water Tank	Spectra-TAC	None

TIP Don't see any Channels in the list? See ***Adding a Channel*** on page ***92*** for instructions on how to create channels.

Legacy MCN Modules - Group & Module Numbers

The program assigns the first module a Group:Module address of 00:0.
If this is not correct for your system, you can change the Group & Module numbers.

Group numbers are hex values that can be from 00 to FE.
Module numbers are hex values that can be from 0 to F.

The program will automatically increment the Module number from the last used number.
When the Module number rolls over from F to 0, it will increment the Group number.

Group & Module number combinations in any particular MCN system must be unique. The MCN Server can access multiple separate MCN Networks with multiple HIB-IP units. Separate MCN Networks are networks that are not tied together with EXB modules. Separate MCN Networks can have modules with the same MCN Group & Module number combinations.

Automatic Linking to Receiver Window

When you add a new Hardware Module, the program automatically adds the appropriate number of Receivers or I/O Groups in the Receiver window.

When you change the order of hardware modules in the Hardware window, the Receivers & I/O Groups follow in the Receiver Window.

When you select a hardware module, the receiver window scrolls so that the first receiver or I/O group in that module is visible.

Hardware Window Toolbar Buttons

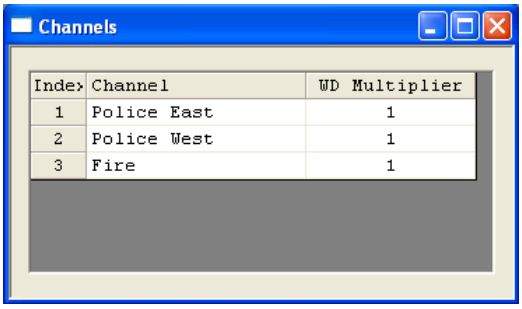
The following toolbar buttons will also function in the Hardware Window:

Append Insert Delete Copy Paste

See ***Toolbars*** on page ***72*** for more details.

Configuring Radio Channels - Channels Resource Window

The Channels Window contains a list of radio channels used in the system. Channels can be used to group a number of hardware modules. The Channel name can also be included in error log lines.



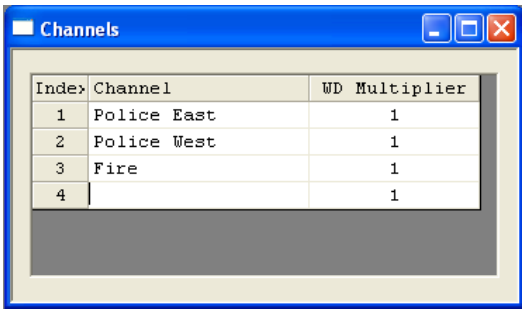
Each channel has the following fields:

Channel
Channel name. (e.g.: Fire East, Countywide, Command, etc.) Free format text field.
Used in error logging

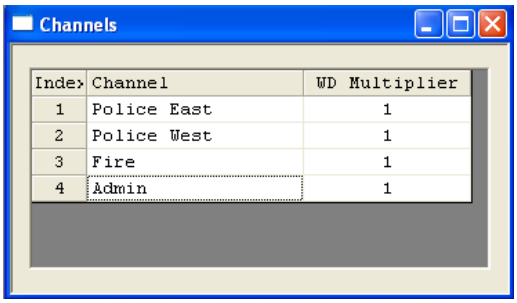
WD Multiplier
Watchdog Time Multiplier. Drop-down field: Select a multiplier value from the list.
The Watch Dog Multiplier is used only for the System Performance Toolkit Option.
This is a licensed feature that is not currently supported on the MCN Server 8000 system.

Adding a Channel

Add new channel with the **New Channel** button.
The program will add a new Channel to the end of the list

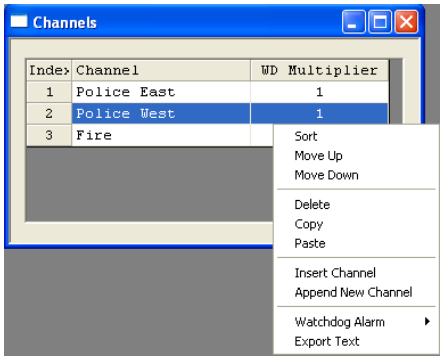


Enter the Channel Name.



Channel Window Context Sensitive (Right Click) Menu

By right-clicking on the Channel list, the following menu appears:



Sort: organizes the channels alphabetically.

Move Up and **Move Down:** will shift the selected channel up or down in the list.

Delete: will erase a channel.

Copy: will record the current selection to the clipboard.

Paste: will write the clipboard contents to a specified location.

Insert New Channel: will add a new channel at a specific location in the list.

Append New Channel: adds a new channel at the end of the list.

Watch Dog Alarm: enables or Disable Watchdog flags for all receivers, and points, in the channel. (Used only with the System Performance Toolkit 'SPT' Option.)

Export Text: will export a text file copy, of the contents for this window.

Channel Window Toolbar Buttons

The following toolbar buttons will also function in the Channel Window:

See ***Toolbars*** on page ***72*** for more details.

Adding Receiver Data - Receivers Resource Window

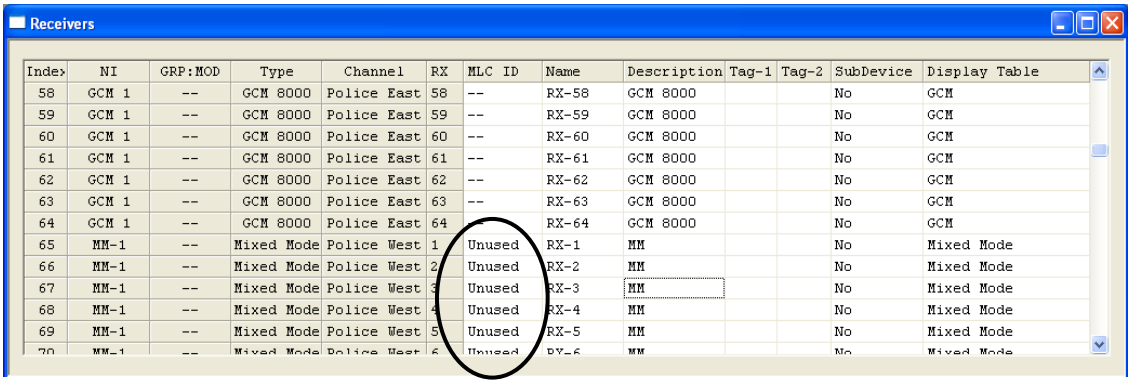
When you build or modify your system, use the Receivers window to enter or edit

- The site names for all the receivers in the system.
- Input/Output point names for I/O modules
- Additional other useful information for receivers or I/O points such as location, T1 or leased line information, site number
- Select the Display Table to use
- Advanced systems: Select Subcomparator devices
- Future System Performance Toolkit: Enable/disable Watchdog Alarms
- Output Redirect Option: Link this input to an output

This widow is based on the modules defined in the Hardware Window.

IP Comparators in the Receiver Window:

When IP Comparators are added to the system configuration as described in the previous sections, the Name field is populated with the names "RX-1" through "RX-64" as shown below.



Index	NI	GRP:MOD	Type	Channel	RX	MLC ID	Name	Description	Tag-1	Tag-2	SubDevice	Display Table
58	GCM 1	--	GCM 8000	Police East	58	--	RX-58	GCM 8000			No	GCM
59	GCM 1	--	GCM 8000	Police East	59	--	RX-59	GCM 8000			No	GCM
60	GCM 1	--	GCM 8000	Police East	60	--	RX-60	GCM 8000			No	GCM
61	GCM 1	--	GCM 8000	Police East	61	--	RX-61	GCM 8000			No	GCM
62	GCM 1	--	GCM 8000	Police East	62	--	RX-62	GCM 8000			No	GCM
63	GCM 1	--	GCM 8000	Police East	63	--	RX-63	GCM 8000			No	GCM
64	GCM 1	--	GCM 8000	Police East	64	--	RX-64	GCM 8000			No	GCM
65	MM-1	--	Mixed Mode	Police West	1	Unused	RX-1	MM			No	Mixed Mode
66	MM-1	--	Mixed Mode	Police West	2	Unused	RX-2	MM			No	Mixed Mode
67	MM-1	--	Mixed Mode	Police West	3	Unused	RX-3	MM			No	Mixed Mode
68	MM-1	--	Mixed Mode	Police West	4	Unused	RX-4	MM			No	Mixed Mode
69	MM-1	--	Mixed Mode	Police West	5	Unused	RX-5	MM			No	Mixed Mode
70	MM-1	--	Mixed Mode	Police West	6	Unused	RX-6	MM			No	Mixed Mode

GCM 8000 Comparator (only) Shortcut:

If you'd like to get your system configured quickly, you can build a screen with the default receiver names and then change the names later. To do this, jump ahead to the Building Screens -- Display Windows section on page ***99*** to start building display screens.

Caution: MLC 8000 Analog Comparator & Mixed Mode System:

DON'T JUMP AHEAD if you have MLC 8000 Analog Comparators or Mixed Mode systems. You must enter the **MLC ID** for each active receiver on those systems.

TIP

Fast Navigation in Receiver Window

The Receiver Window is linked to the Hardware Window. Clicking on a module in the Hardware Window will bring up the first receiver of that module in the Receiver Window.

Entries in the Receivers Window have the fields shown below. Some fields may not be visible in the window depending on (a) the options licensed in the system and (b) the settings in the **View** menu item.

NI
Network Interface for this hardware module. This is a read-only field and is defined in the Hardware window.

Grp:Mod
The MCN Group & Module number for legacy MCN devices. This is a read-only field defined in the Hardware Window. The order of modules follows the module order in the Hardware window.

Type
The IP Comparator Type (GCM 8000, MLC 8000 Analog Comparator, Mixed Mode) or legacy MCN Module Type (CIB, AIB, IOB Std, IOB 2 Bit, IOB 1 Bit, etc.) for the hardware module. This is a read-only field that is controlled in the Hardware Window

Channel
The radio channel for the hardware module. Read-only field (defined in Hardware list).

Rx
The Receiver Number for this receiver. This is a sequential number for a particular receiver within its module or comparator. Read-only field. The maximum receiver number in a module is based on the Bank number in the Hardware list.

For GPIO modules, this is a point number within the module.

MLC ID (MLC 8000 Analog Comparators and Mixed Mode Systems only)
This is the identifier for the MLC 8000 Analog Comparator port that is associated with this receiver or BR.
It must be entered for all active receivers in these types of systems.

This field is found in the MMC_Cfg.csv file generated by the MLC 8000 Analog Comparator CT program. See MLC 8000 Analog Comparator Interfacing on page ***44*** for details.

Name
Receiver site name (ex: North Tower, VA Hospital, etc.) or I/O point name.
Free-format text field. Change the Name by selecting the cell and typing in the name.

You can also cut & paste descriptions from Excel. See ***Using the Clipboard from other Applications*** on Page ***116***.

Description
Free format text field for general customer use. Many customers use this field to store an identifier for the leased line, microwave channel, or T1 channel bank and channel number for this receiver. This field is not required for program operation. The Description field can be used for additional information in error logging detail lines.

TIP

You can also cut & paste descriptions from Excel. See ***Using the Clipboard from other Applications*** on Page ***116*** for more details.

Tag-1
This is a free-format user defined field. It is used with the TPCI option. You can use it as a note field if you are not using the TPCI Option.

Tag-2
This is a free-format user defined field. It is used with the TPCI option. You can use it as a note field if you are not using the TPCI Option.

SubDevice

This is an advanced field and is normally not used on standard MCN Server 8000 systems.

This field will not be present on the screen unless the "Enable Sub Comparators" is enabled under the View Menu. This field indicates if this receiver or I/O point feeds a sub-device. This can be used for passing a Master Vote or a Main/Standby select to other devices. See the Configuring Master-Sub Comparator Systems section on page ***165*** for more details.

WD-Alarm (for System Performance Toolkit Licensed Option)

This is used with the future System Performance Toolkit (SPT) option. It can be enable for each receiver by selecting yes in the Receiver Window under WD Alarm.

It allows the SPT to generate an alarm if No vote or No Receive is detected.

Link to Output (for Output Redirect Licensed Option)

This is an advanced field and is normally not used on standard MCN Server 8000 systems.

It is used for the Output Redirect Option and is designed for use in special cases, to provide alarm outputs (from a CIB or GPIO module) to an external device when a failure on one or more input devices occurs.

Display Table (Default Display Table Selection)

The Display Table field in this window holds the default mapping table to use for this receiver (or alarm point). The Display Table determines what status text is displayed for different combinations of input bits from the hardware modules.

Comparator Display Tables

For comparator applications, the MCN Config Server program will automatically pre-populate this field based upon the Comparator Module that is used:

Module	Default Display Table	Optional Display Table	
CIB or AIB	Comparator		
GCM 8000	GCM 8000	GCM LV	
MLC 8000	MLC 8000	MLC LV	MLC Tech
Mixed Mode	Mixed Mode	MM LV	MM Tech

The IP comparator Display Tables with "LV" indicate Last Vote. They have display the last voted receiver when the system is idle.

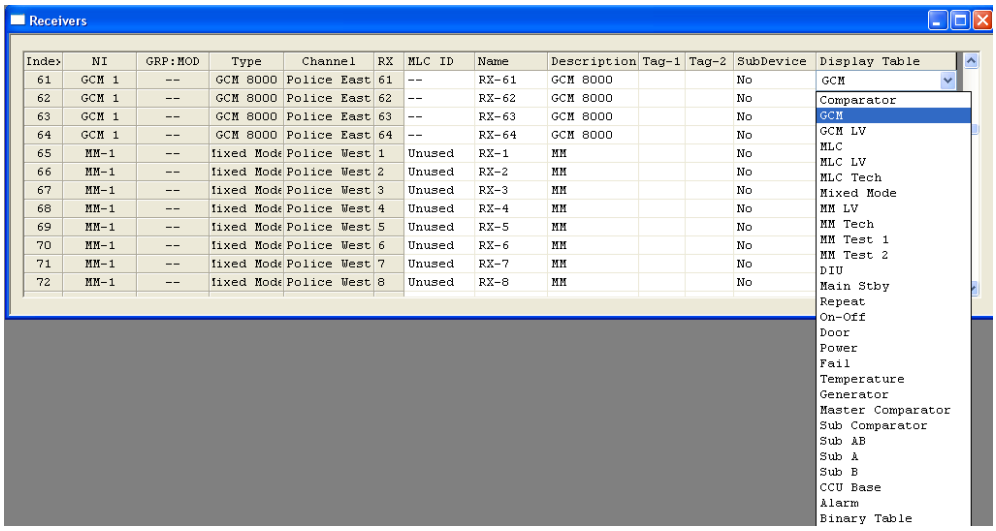
The "Tech" Display tables have more details of interest to a technician.

- The MLC Tech Display Table has signal quality bars that are shown on Receive and Vote activity.
- The MM Tech Display Table has more details on the operation of the individual comparators that make up the Mixed Mode system.

The Display Table selected in the Receivers window will be the default Display Table that will be used when the receiver is placed on a screen. It is recommended that you select the non-Tech Display tables as the default. You can then make additional Tech Screens (Display Windows) and use the Display Table Override procedure to select the Tech Display Table for just the Tech screens. See Using Alternate Display Tables – Override Display Tables on page ***113*** for details.

All the above Display Tables map the inputs from the comparators to the standard "Vote", "Rx", "Dis", and "Fail" statuses. For more information on the states shown in the Display Tables for IP comparators, see the appropriate sections: GCM 8000 Status Display (p ***43***), MLC 8000 Analog Comparator Status Display (p ***53***) or Mixed Mode Status Display (p ***57***).

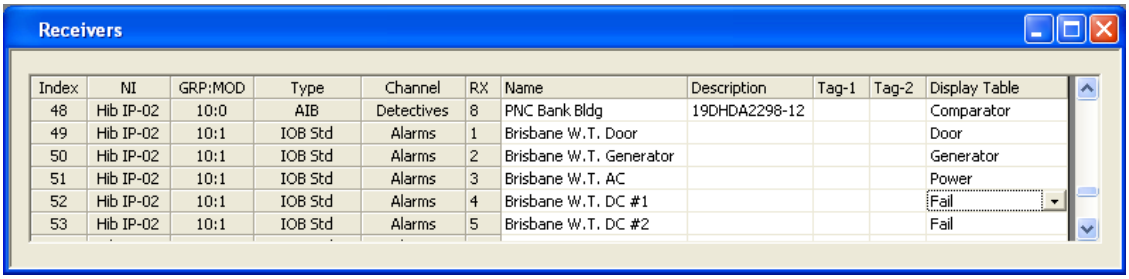
You can change the default Display Table in the Receivers window with the drop-down list.


Receivers
Index NI GRP:MOD Type Channel RX MLC ID Name Description Tag-1 Tag-2 SubDevice Display Table
61 GCM 1 -- GCM 8000 Police East 61 -- RX-61 GCM 8000 No GCM
62 GCM 1 -- GCM 8000 Police East 62 -- RX-62 GCM 8000 No
63 GCM 1 -- GCM 8000 Police East 63 -- RX-63 GCM 8000 No
64 GCM 1 -- GCM 8000 Police East 64 -- RX-64 GCM 8000 No
65 MM-1 -- Mixed Mode Police West 1 Unused RX-1 MM No
66 MM-1 -- Mixed Mode Police West 2 Unused RX-2 MM No
67 MM-1 -- Mixed Mode Police West 3 Unused RX-3 MM No
68 MM-1 -- Mixed Mode Police West 4 Unused RX-4 MM No
69 MM-1 -- Mixed Mode Police West 5 Unused RX-5 MM No
70 MM-1 -- Mixed Mode Police West 6 Unused RX-6 MM No
71 MM-1 -- Mixed Mode Police West 7 Unused RX-7 MM No
72 MM-1 -- Mixed Mode Police West 8 Unused RX-8 MM No
Comparator
GCM
GCM LV
MLC
MLC LV
MLC Tech
Mixed Mode
MM LV
MM Tech
MM Test 1
MM Test 2
DIU
Main Stby
Repeat
On-Off
Door
Power
Fail
Temperature
Generator
Master Comparator
Sub Comparator
Sub AB
Sub A
Sub B
CCU Base
Alarm
Binary Table

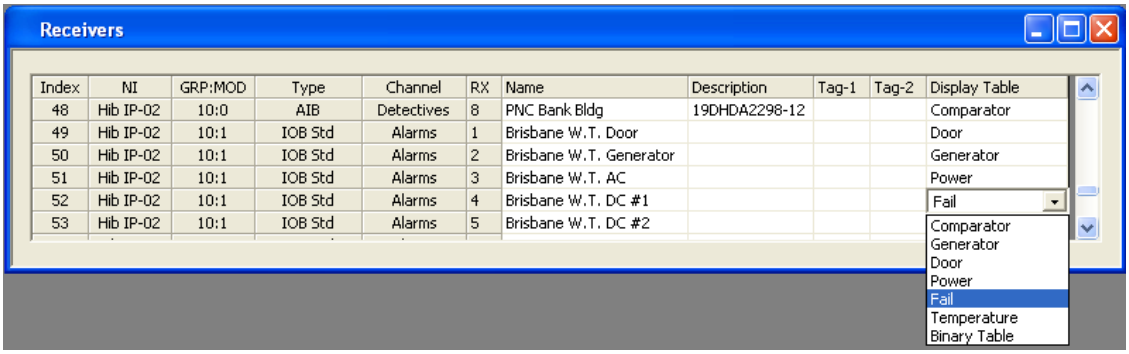
Caution:
Be sure to select an appropriate Display Table to use. Selecting an inappropriate Display Table will result in nonsensical status displays.

I/O Display Tables

If you have any Input / Output groups that can be used for things such as microwave or site alarms, you will need to select a different Display Table (such as "Generator", "Door" or "Power") for those points.


Receivers
Index NI GRP:MOD Type Channel RX Name Description Tag-1 Tag-2 Display Table
48 Hib IP-02 10:0 AIB Detectives 8 PNC Bank Bldg 19DHDA2298-12 Comparator
49 Hib IP-02 10:1 IOB Std Alarms 1 Brisbane W.T. Door Door
50 Hib IP-02 10:1 IOB Std Alarms 2 Brisbane W.T. Generator Generator
51 Hib IP-02 10:1 IOB Std Alarms 3 Brisbane W.T. AC Power
52 Hib IP-02 10:1 IOB Std Alarms 4 Brisbane W.T. DC #1 Fail
53 Hib IP-02 10:1 IOB Std Alarms 5 Brisbane W.T. DC #2 Fail

This is a drop-down field. Select one of the Display Tables from the drop-down list.


Receivers
Index NI GRP:MOD Type Channel RX Name Description Tag-1 Tag-2 Display Table
48 Hib IP-02 10:0 AIB Detectives 8 PNC Bank Bldg 19DHDA2298-12 Comparator
49 Hib IP-02 10:1 IOB Std Alarms 1 Brisbane W.T. Door Door
50 Hib IP-02 10:1 IOB Std Alarms 2 Brisbane W.T. Generator Generator
51 Hib IP-02 10:1 IOB Std Alarms 3 Brisbane W.T. AC Power
52 Hib IP-02 10:1 IOB Std Alarms 4 Brisbane W.T. DC #1 Fail
53 Hib IP-02 10:1 IOB Std Alarms 5 Brisbane W.T. DC #2
Comparator
Generator
Door
Power
Fail
Temperature
Binary Table

Alarms and Display Tables

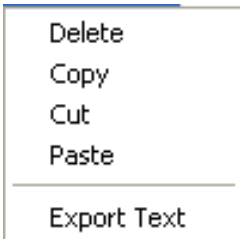
You can configure "sticky" alarms in the system through the Display Tables. Alarms will be displayed in the Alarm tab of the System events (Log) Window. They will remain in that window until acknowledged and reset. Alarms can also generate sounds when they go into the active state. See the Alarm Display – Log Window / Alarms Tab section on page ***133*** for details on Alarm operations and the States Tab section starting on page ***155*** for instructions on how to enable alarms in the Display Tables.

Customizing Display Tables

If you need custom Display Tables, or need to edit the standard Display tables, see the Working with Display Tables section on page ***153*** for an in-depth discussion.

Receiver Window Context Sensitive (Right Click) Menu

The following menu functions are available with a right click in the Receiver list.



Receiver Window Toolbar Buttons

The following toolbar buttons will also function in the Receiver Window:

See ***Toolbars*** on page ***72*** for more details.

Since the Receiver & I/O Group rows are controlled by the Hardware Window, functions such as Append, Insert, Sort, Up, & Down are not available in this window.

Building Screens -- Display Windows

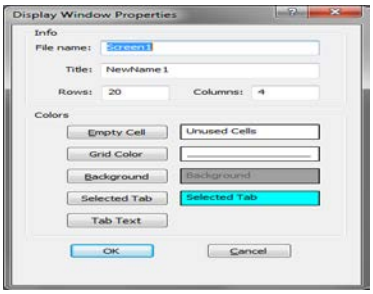
Display windows are the screens that you build for the MCN Server program and MCN Client Remote Comparator Display program. Each Display Window can contain multiple Tabs and multiple channels.

In this section, you will learn how to:

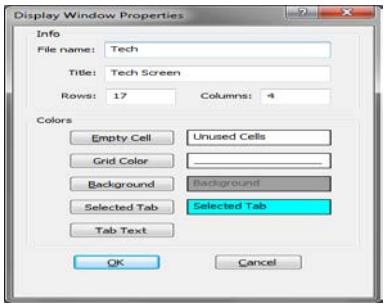
- Add a new Display window
- Add Labels
- Add Receivers (and I/O groups)
- Add Tabs
- Move & Modify Labels & Receivers

Adding a New Display Window

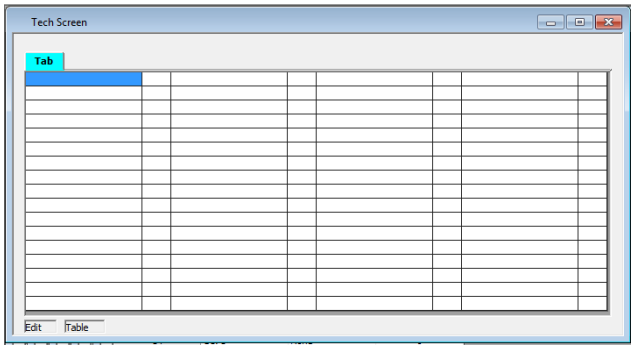
Add a new Display Window with the **Add Display Window** button.



Change the File Name, Title, Rows, and Columns as desired and click the **OK** button.

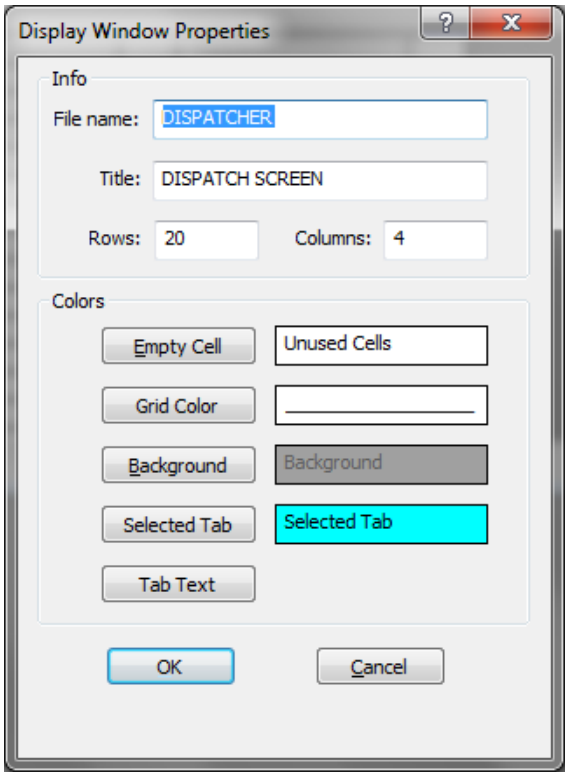


A blank Display Window with one Tab will appear



Renaming a Screen (Display Window)

You can rename existing screens if changes are made to the system; by opening the specific screen, clicking the "**Edit**" tab and selecting "**Display Window Properties**".

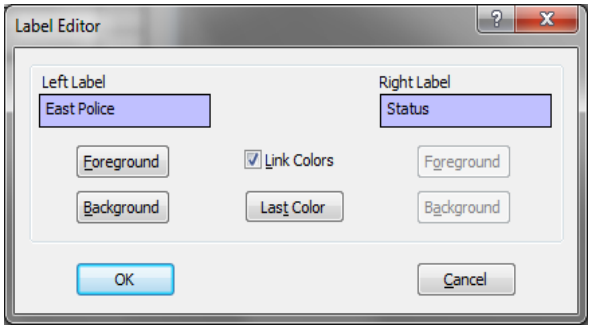


Adding Labels to the Display Window

Labels are used to identify and differentiate between multiple channels, if displayed in one tab.

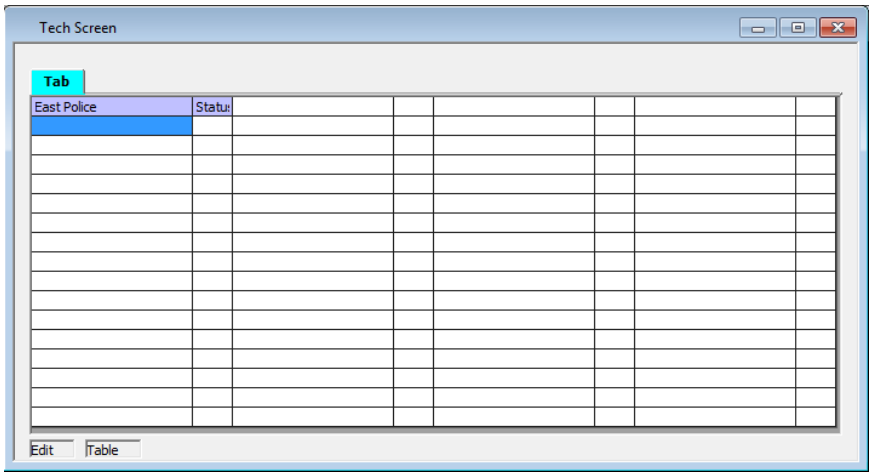
Add a new Label in the Display Window with the **Add Label** button.

In the Label Editor Dialog Box, enter the desired Right & Left Labels.
The left label will appear over the receiver names.
The right label will appear over the status column.



You can also change the Foreground (text) and Background colors at this time.
If the Link Colors box is checked, both the left & right labels will have the same color set.

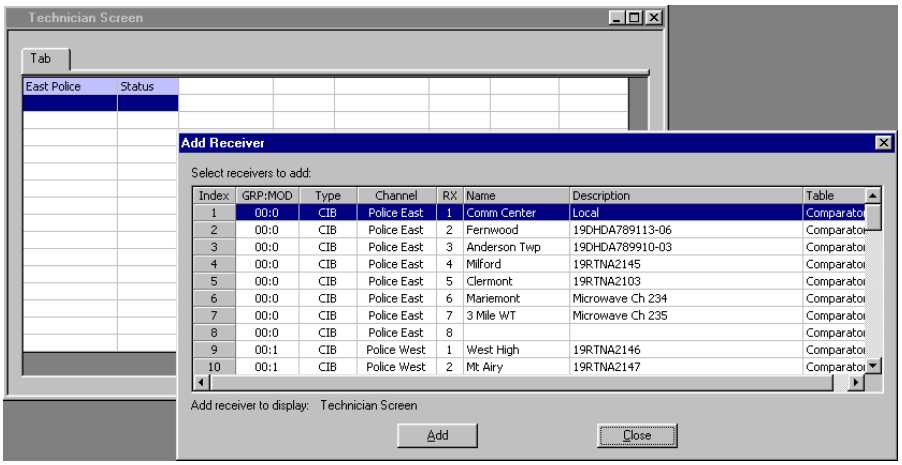
Hit OK when you are done.
The label will be placed on the screen.



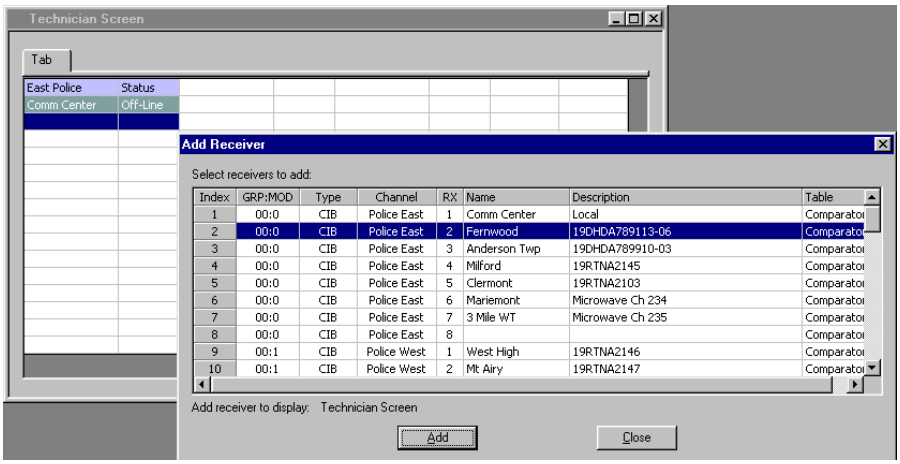
Adding Receivers & I/O Groups to the Display Window

Add new Receivers or I/O Groups in the Display Window using the **Add Receiver** button from the Toolbar on the left.

An **Add Receiver** dialog box will appear.
This is similar to the Receiver Window, but it has additional buttons.

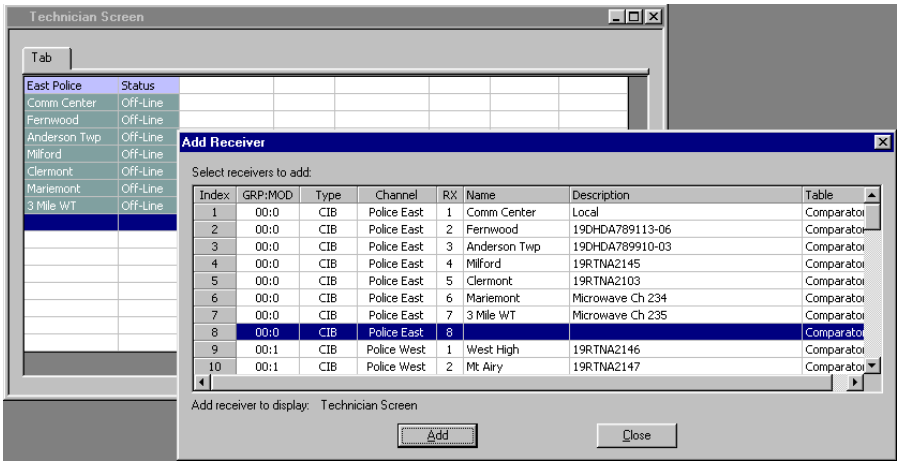

Technician Screen
Tab
East Police
Status
Add Receiver
Select receivers to add:
Index GRP:MOD Type Channel RX Name Description Table
1 00:0 CIB Police East 1 Comm Center Local
2 00:0 CIB Police East 2 Fernwood 19DHDA789113-06
3 00:0 CIB Police East 3 Anderson Twp 19DHDA789910-03
4 00:0 CIB Police East 4 Milford 19RTNA2145
5 00:0 CIB Police East 5 Clermont 19RTNA2103
6 00:0 CIB Police East 6 Mariemont Microwave Ch 234
7 00:0 CIB Police East 7 3 Mile WT Microwave Ch 235
8 00:0 CIB Police East 8
9 00:1 CIB Police West 1 West High 19RTNA2146
10 00:1 CIB Police West 2 Mt Airy 19RTNA2147
Add receiver to display: Technician Screen
Add
Close

Select the receiver or I/O group that you what to add, and click the **Add** button.


Technician Screen
Tab
East Police
Status
Comm Center
Off-Line
Add Receiver
Select receivers to add:
Index
GRP:MOD
Type
Channel
RX
Name
Description
Table
1 00:0 CIB Police East 1 Comm Center Local
2 00:0 CIB Police East 2 Fernwood 19DHDA789113-06
3 00:0 CIB Police East 3 Anderson Twp 19DHDA789910-03
4 00:0 CIB Police East 4 Milford 19RTNA2145
5 00:0 CIB Police East 5 Clermont 19RTNA2103
6 00:0 CIB Police East 6 Mariemont Microwave Ch 234
7 00:0 CIB Police East 7 3 Mile WT Microwave Ch 235
8 00:0 CIB Police East 8
9 00:1 CIB Police West 1 West High 19RTNA2146
10 00:1 CIB Police West 2 Mt Airy 19RTNA2147
Add receiver to display: Technician Screen
Add
Close

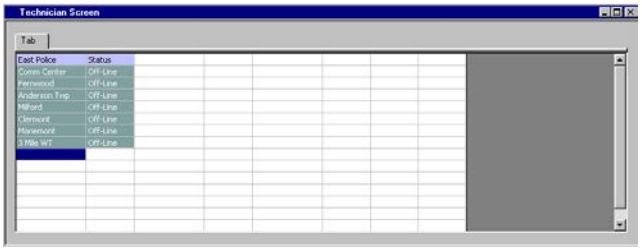
An **Add Receiver** dialog box will appear.
This is similar to the Receiver Window, but it has additional buttons.

Press the **Add** button for each additional receivers or I/O groups you wish to add.



The program will continue adding receivers to the selected column in the Display Window.
If it reaches the bottom of a column, it will wrap to the top of the next column.

When you are finished adding a range of receivers or I/O groups, click the **Close** button.

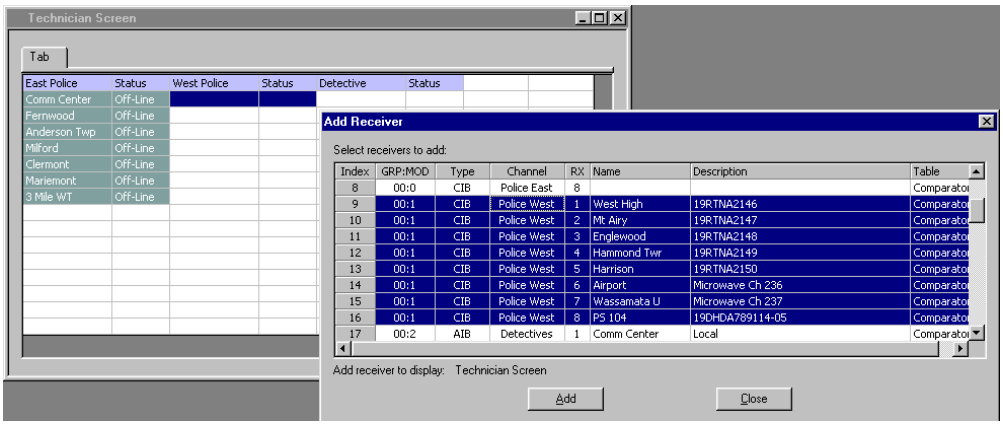


Move to the position for the next receiver and repeat until you have all the receivers added.

Adding a block of receivers or I/O points to the Display Window

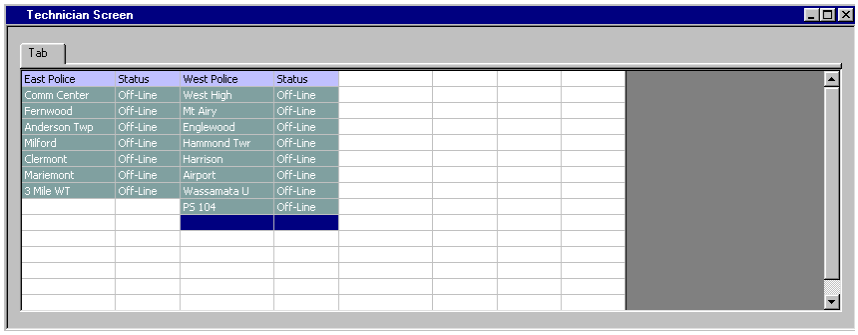
Press the **Add Receiver** button.

In the Add Receivers dialog box, select a block of receivers



Hit the **Add** button.

This will add the receivers all at once,..



Automatic Linking to Receiver Window

As you select different cells in the Display Window, the receiver window scrolls so that that receiver or I/O group is visible.

Verifying Receiver Placement

Many systems have receivers from many channels at each site. Since only a Receiver site name or I/O Group name is present in the Display Window, it is not readily apparent which particular receiver or I/O point is in a particular cell. You can quickly check the contents of the Display Window by doing the following:

Open the Display Window

Open the Receiver Window.

Select the first Receiver in the Display Window.

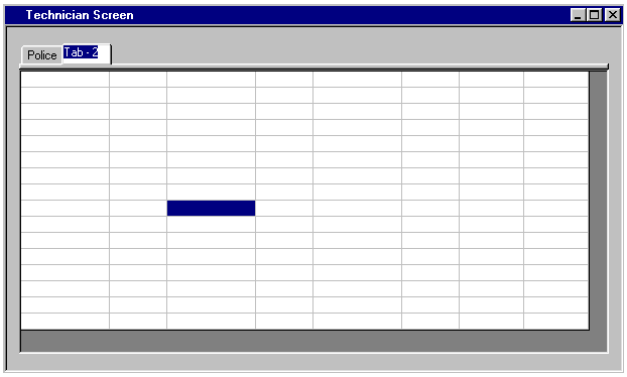
The Receiver Window will show which receiver is at that cell.

Use the arrow keys to move through all the receivers on the Display Window.

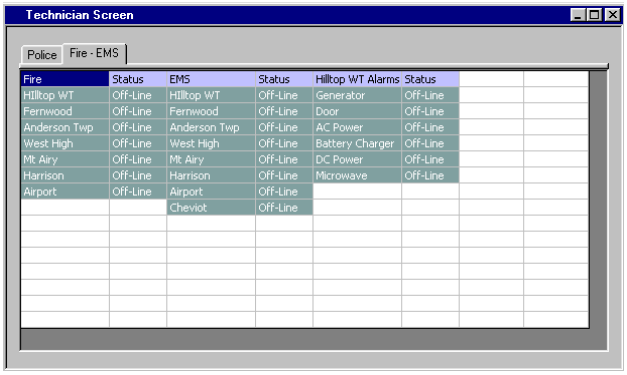
Repeat for the other tabs in the Display Window.

Adding Tabs to the Display Window

Press the **Add Tab** button.
Enter the name for the new tab.
A blank grid will appear.

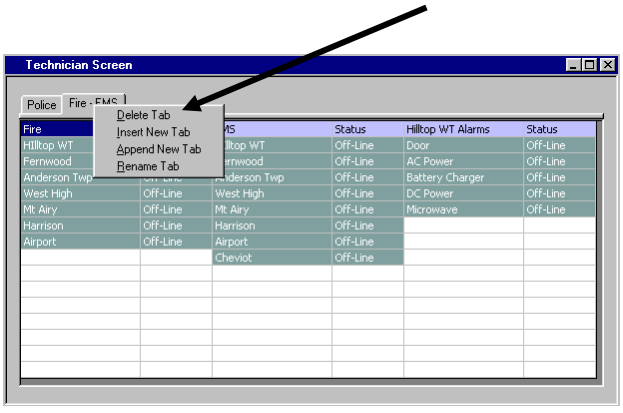


Add Labels, Receivers, and I/O Groups for that tab.



Deleting Display Tabs

Right-click on the tab and select ***Delete Tab*** from the pop-up menu.

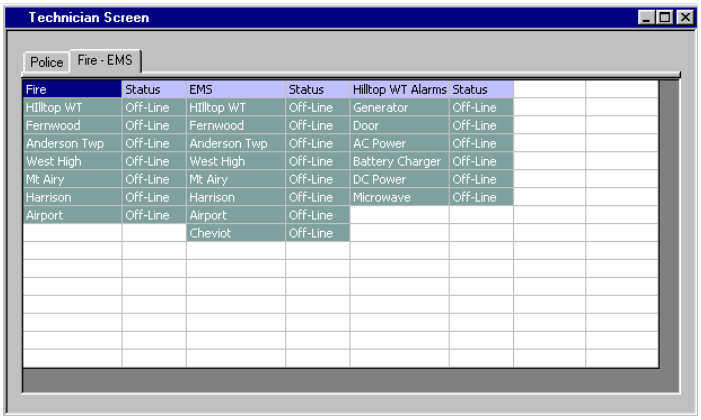


Changing Display Window Parameters

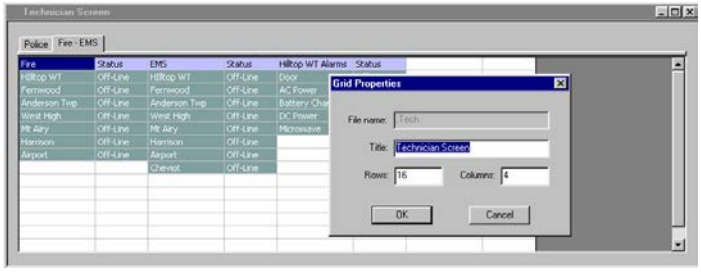
You can change the following properties of a Display Window.

- Display Window Title
- Number of Rows
- Number of Columns

In this example, we want to get rid of the unused fourth column.

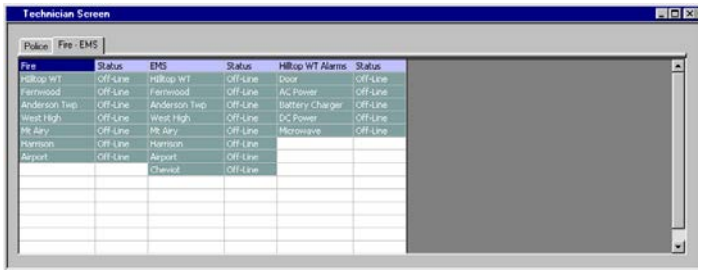


Press the **Display Window Properties** button.



Change the number of Columns from 4 to 3.
(You could also change the Title or number of rows at this point.)

Hit the **OK** button.

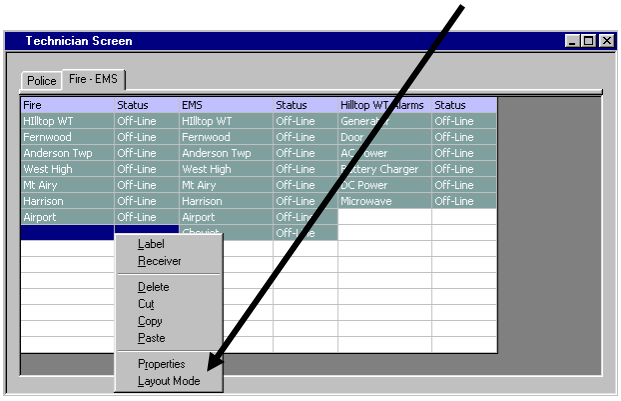


The number of columns is reduced for all tabs. If you reduce the grid size, you may lose receivers or labels that fall outside the new range. Receivers and I/O Groups are still in the Receivers Window; they just disappear from the Display Window.

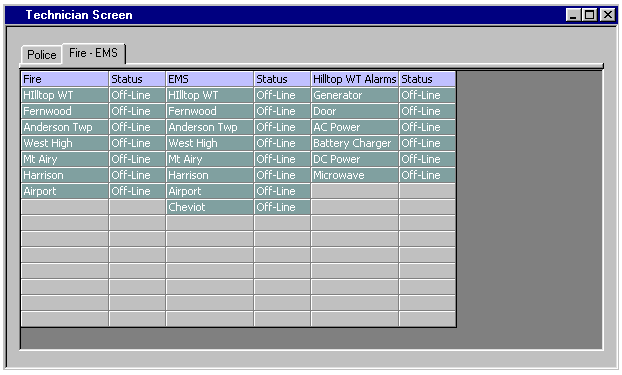
Changing Column Widths in Layout Mode

You can change the column width for the resulting Display Window. To do this, you must go into Layout Mode.

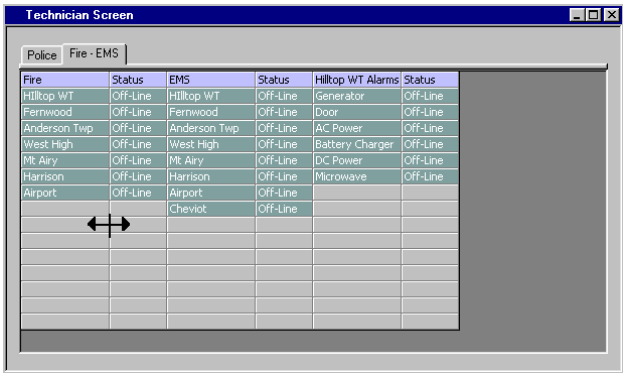
Right-click in the grid and select ***Layout Mode***.



The grid will turn gray, indicating it is in Layout Mode.

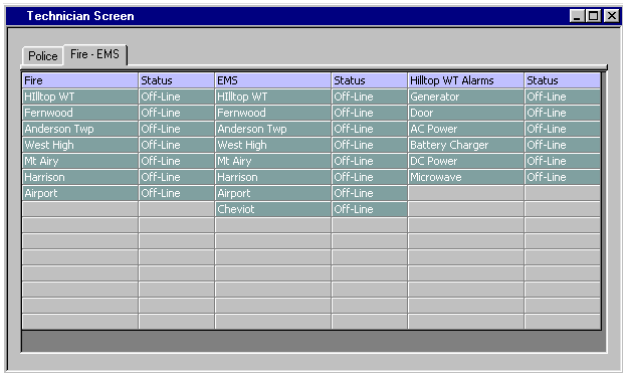


Move the cursor over a column separator line. The cursor will turn into a double-headed arrow.



Press the left mouse button and drag the column to the proper width.

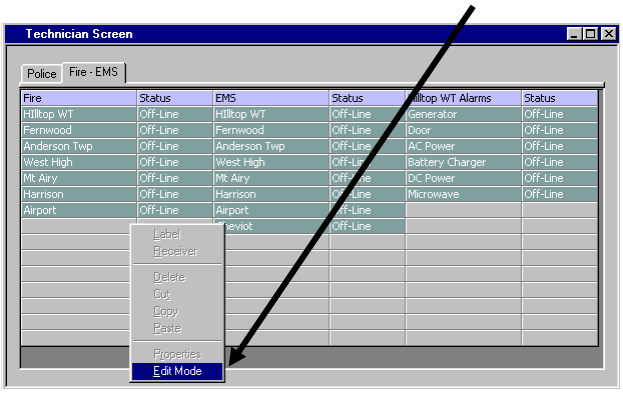
Repeat with the right column separator for the Status column.



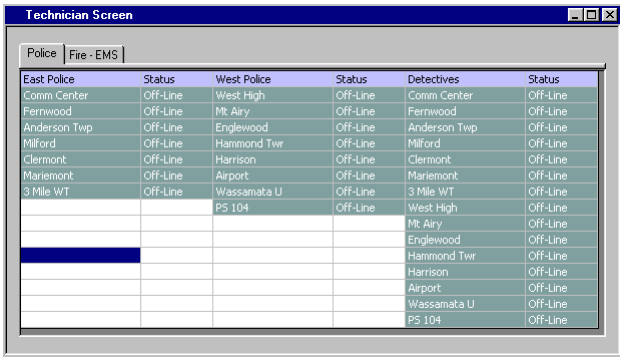
Column Width Note

All the Receiver columns are the same width.
All the Status columns are the same width.
Changing a column width will change the width of all the similar columns on all tabs.

Right-Click in the grid and select ***Edit Mode***.



The window will return to Edit mode.

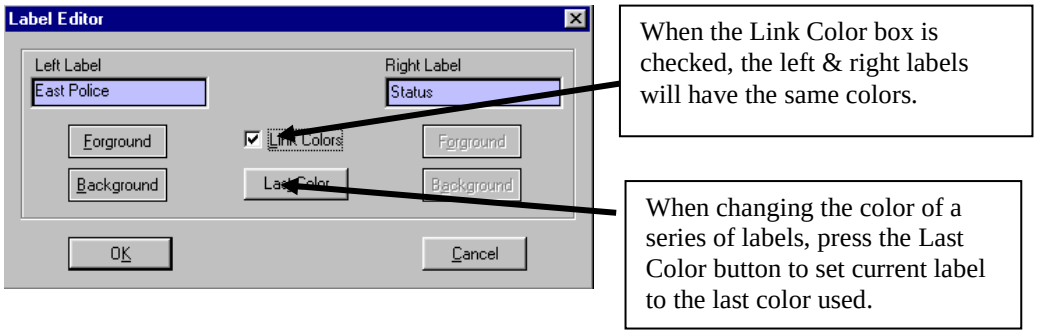


Changing Label Text & Colors

You can change a Label text or color by doing one of the following:

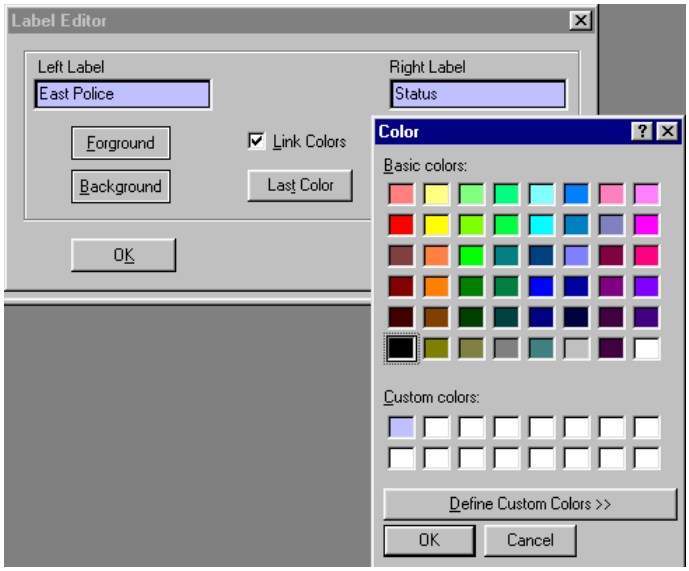
- Double click on a Label.
- Right-Click on the Label and select the ***Label*** menu item.
- Select a Label cell and press the ***New Label*** toolbar button.

The Label Edit dialog box will appear.



You can edit the left & right text.

You can change the Foreground or Background color of the labels by hitting the **Foreground** or **Background** button below the label



Select a color and hit **OK**

If you want a color not shown, hit the **Define Custom Colors** button.

Moving Receivers & Labels in the Display Window

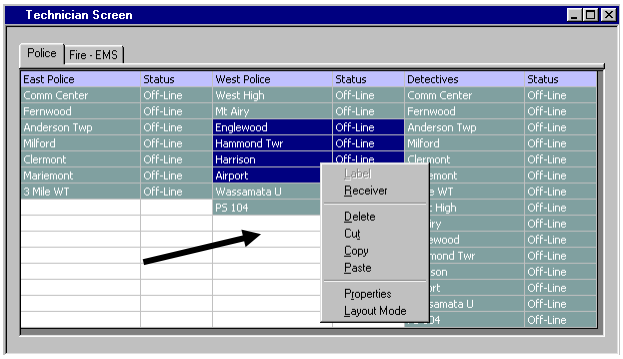
This section covers single column cuts & pastes. See the next section for cutting & pasting multi-column selections

To move Labels, Receivers, or I/O Groups:

Select the items to move

Right click and select the Cut menu item.

(Alternately, use the ***Cut*** toolbar button)

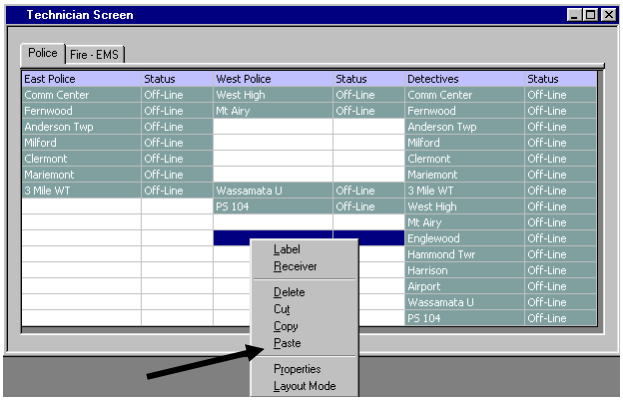


This cuts the selection and places it in the clipboard.

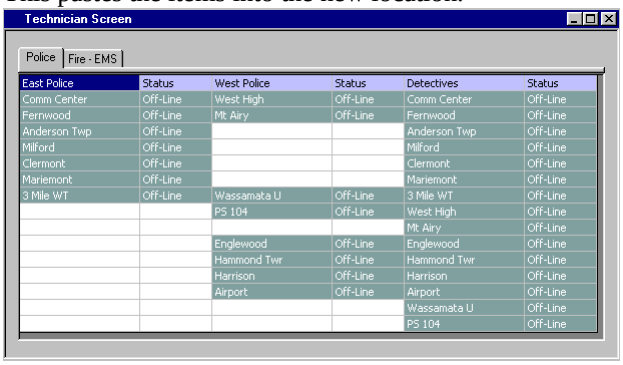
Move to the desired location

Right click and hit Paste.

(Alternately, use the ***Paste*** toolbar button)



This pastes the items into the new location.



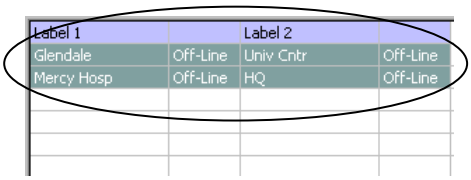
Cutting & Pasting Multiple Columns

Cutting and pasting occur in the following order:

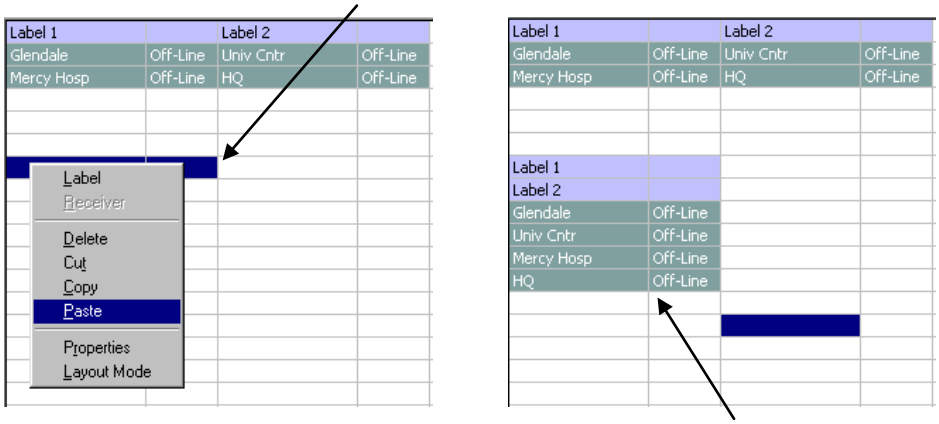
1. Across (left to right)
2. Down

Copying the range shown puts the cells into the clipboard in the following order:

1. Label 1
2. Label 2
3. Glendale Rx
4. Univ Cntr Rx
5. Mercy Hosp Rx
6. HQ Rx

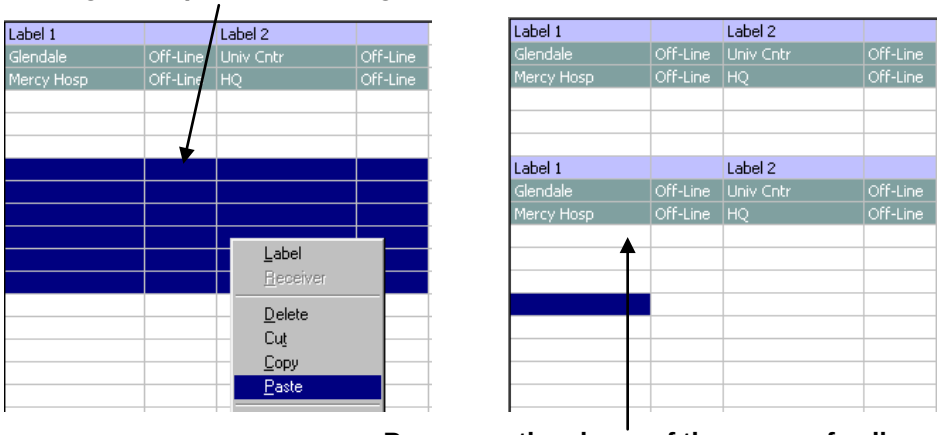


Pasting the clipboard to a single cell or column…



Results in a single column (probably not the result you wanted.)

Pasting the clipboard to a range with the same number of columns …



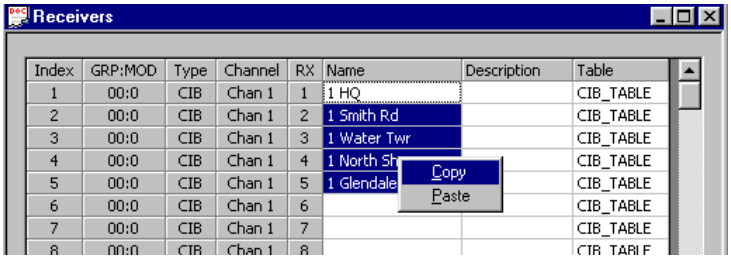
Preserves the shape of the range of cells.

Pasting a Row of Receivers Directly from the Receiver Window

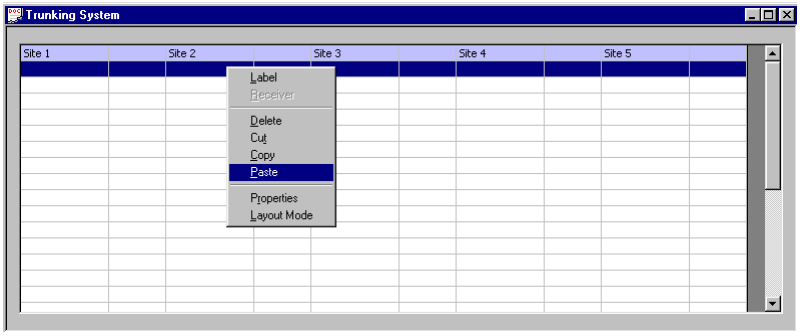
All the examples shown assume you have a system with many receiver sites and want to look at the sites in a column arrangement. If you have a trunking system with many channels but just a few sites, you may want to display each channel as a row with the sites going across from left to right.

You can do this by cutting and pasting a group of receivers directly from the Receiver Window into the Display Window.

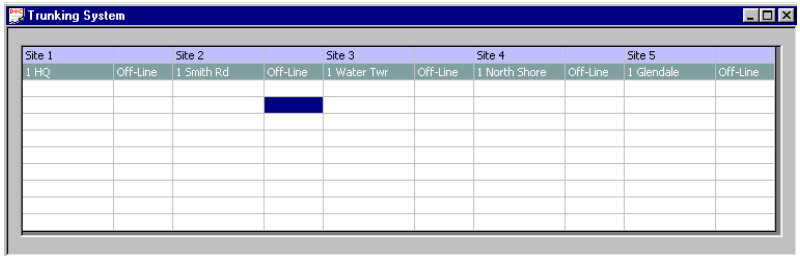
1. From the Receiver Window, highlight a group of receivers and Copy to clipboard.


Receivers
Index GRP:MOD Type Channel RX Name Description Table
1 00:0 CIB Chan 1 1 1 HQ CIB_TABLE
2 00:0 CIB Chan 1 2 1 Smith Rd CIB_TABLE
3 00:0 CIB Chan 1 3 1 Water Twr CIB_TABLE
4 00:0 CIB Chan 1 4 1 North Sh CIB_TABLE
5 00:0 CIB Chan 1 5 1 Glendale CIB_TABLE
6 00:0 CIB Chan 1 6 CIB_TABLE
7 00:0 CIB Chan 1 7 CIB_TABLE
Copy
Paste

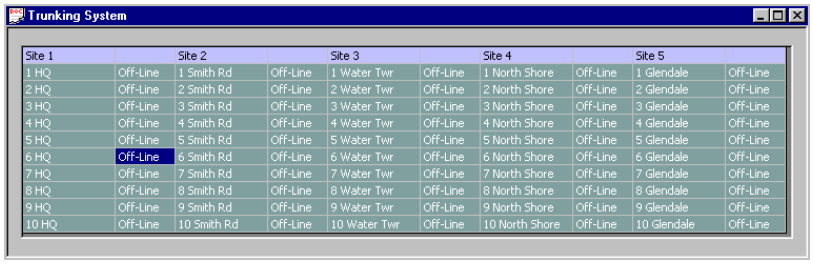
2 Go to the Display Window.
Move the cursor to the starting position for the row of receivers.
Highlight the row and Paste the clipboard to the screen.



3 The receivers are pasted into the Display Window in a horizontal row:


Trunking System
Site 1 Site 2 Site 3 Site 4 Site 5
1 HQ Off-Line 1 Smith Rd Off-Line 1 Water Twr Off-Line 1 North Shore Off-Line 1 Glendale Off-Line

4. A 10-Channel 5-Site System


Trunking System
Site 1 Site 2 Site 3 Site 4 Site 5
1 HQ Off-Line 1 Smith Rd Off-Line 1 Water Twr Off-Line 1 North Shore Off-Line 1 Glendale Off-Line
2 HQ Off-Line 2 Smith Rd Off-Line 2 Water Twr Off-Line 2 North Shore Off-Line 2 Glendale Off-Line
3 HQ Off-Line 3 Smith Rd Off-Line 3 Water Twr Off-Line 3 North Shore Off-Line 3 Glendale Off-Line
4 HQ Off-Line 4 Smith Rd Off-Line 4 Water Twr Off-Line 4 North Shore Off-Line 4 Glendale Off-Line
5 HQ Off-Line 5 Smith Rd Off-Line 5 Water Twr Off-Line 5 North Shore Off-Line 5 Glendale Off-Line
6 HQ Off-Line 6 Smith Rd Off-Line 6 Water Twr Off-Line 6 North Shore Off-Line 6 Glendale Off-Line
7 HQ Off-Line 7 Smith Rd Off-Line 7 Water Twr Off-Line 7 North Shore Off-Line 7 Glendale Off-Line
8 HQ Off-Line 8 Smith Rd Off-Line 8 Water Twr Off-Line 8 North Shore Off-Line 8 Glendale Off-Line
9 HQ Off-Line 9 Smith Rd Off-Line 9 Water Twr Off-Line 9 North Shore Off-Line 9 Glendale Off-Line
10 HQ Off-Line 10 Smith Rd Off-Line 10 Water Twr Off-Line 10 North Shore Off-Line 10 Glendale Off-Line

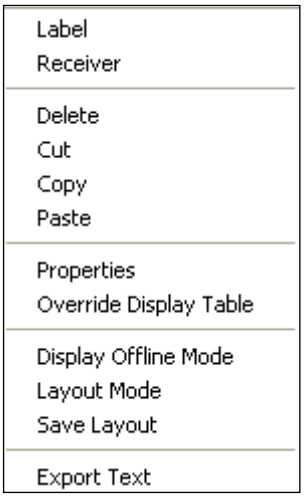
Display Window Tools

Display Window Tab Context Sensitive (Right Click) Menu

The menu functions shown are available with a right click on a Display Window Tab. They provide a shortcut to get to the listed functions.

Display Window Context Sensitive (Right Click) Menu

The following menu functions are available with a right click in the Display Window Grid.

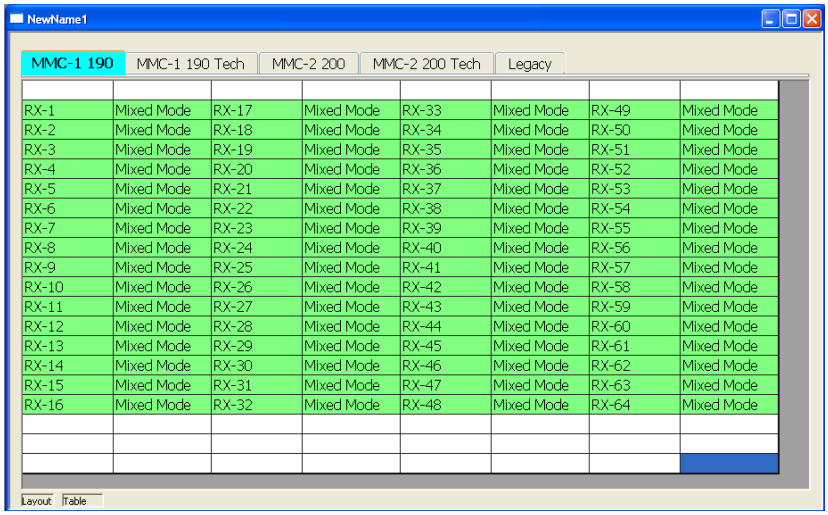


Label	Add a label at this cell
Receiver	Add a receiver or I/O point at this cell
Delete	Delete the contents of the selected cell(s)
Cut	Cut the contents of the selected cell(s) and place on clipboard
Paste	Paste a copy of the receiver(s) or label(s) from the clipboard to this cell (and possibly others)
Properties	Display the properties of the contents of this cell.
Override Display Table	Use a special Display Table for receiver(s) in the selected cell(s). This allows you to use an n alternate (ex: Tech) Display Table on a particular screen. See below for details.)
Display Offline Mode	Changes the display to show Offline in the cells instead of the currently selected Display Table. This is hardly ever used and is provided for backwards compatibility.
Layout Mode	Changes to Layout Mode to allow column re-sizing.
Save Layout	Saves the current screen column width and window position.
Export Text	Exports a text version of the screen layout.

Using Alternate Display Tables – Override Display Tables

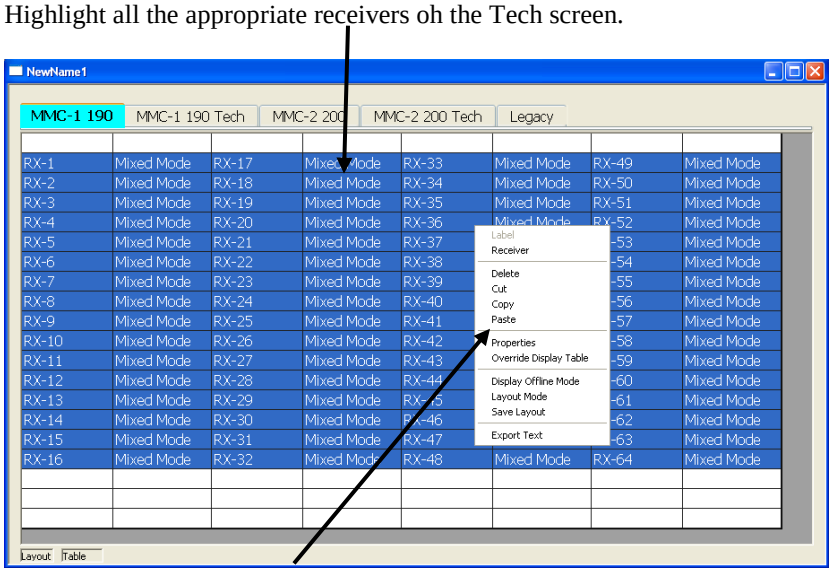
There are multiple Display Tables that can be used with IP comparators. Each comparator has a standard Display Table and a Last Vote Display Table. The MLC 8000 Analog Comparators and the Mixed Mode systems also have Tech Display Tables. You can build screens using the default (or Last Vote) Display Tables for your users and separate Tech screens that use the Tech Display Tables using the following technique:

1. Build the standard User screen (Display Windows)
2. Build new Tech screens (Display Windows)
3. Copy the Labels & Receivers from the standard User screen to the Tech screen. Be sure to highlight the proper number of columns when you paste the data to the Tech screen.



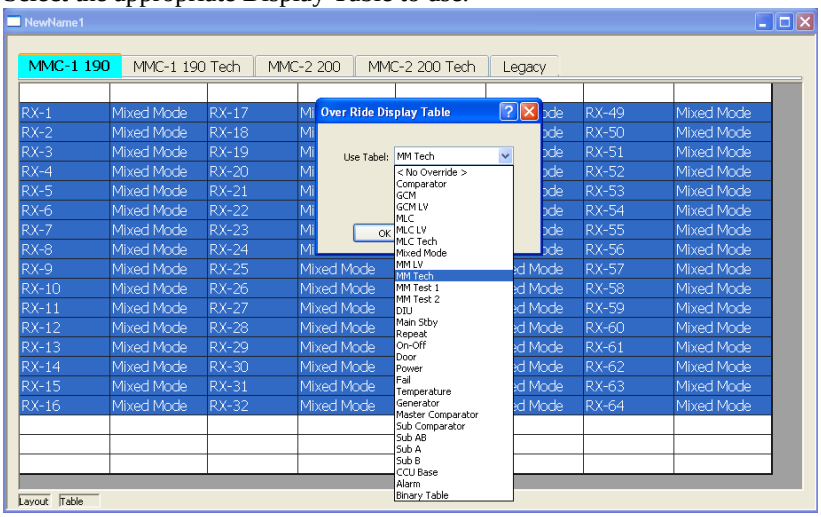
Default Display Tables will appear in green.

4. Highlight all the appropriate receivers oh the Tech screen.

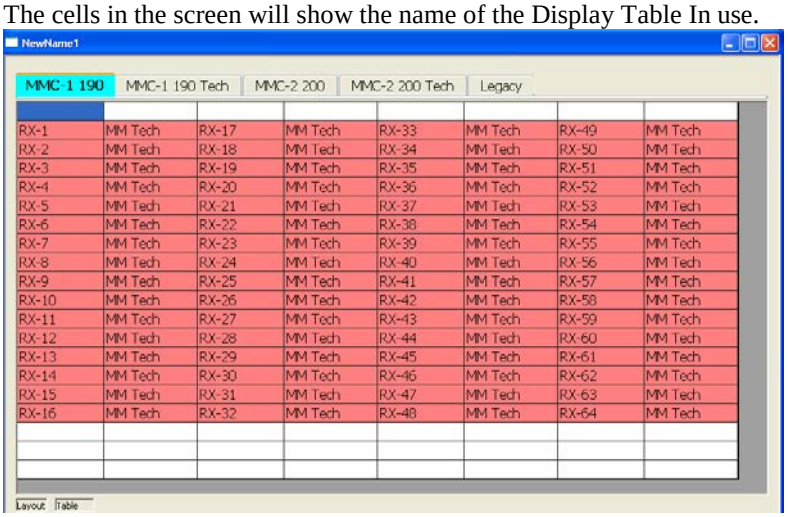


5. Right-Click and select "Override Display Table"

6. Select the appropriate Display Table to use.



7. The cells in the screen will show the name of the Display Table In use.



   The Alternate Display Tables will be displayed in a salmon color.

8. Save the system.

Results:

- You will see the system displayed using the default display tables on the User screen.
- You will see the system displayed with the alternate Display Table on the Tech screen.
- Your users can use the User screen on their Client PC and you can use the Tech Screen on the Server or your Client PC.

Using the Last Vote Display Tables as defaults

You can use the Last Vote Display Tables as your default Display Tables by selecting them in the Receivers window. Then any new screen you build will use the Last Vote Display Tables by default.

Hint

Quick Receiver & Label Changes

You can double-click on a Receiver or Label cell to change it. The “Add Receiver” or “Add Label” dialog box will open, allowing you to make changes to the cell.

Display Window Toolbar Buttons

The following toolbar buttons will also function in the Receiver Window:

Delete

Cut

Copy

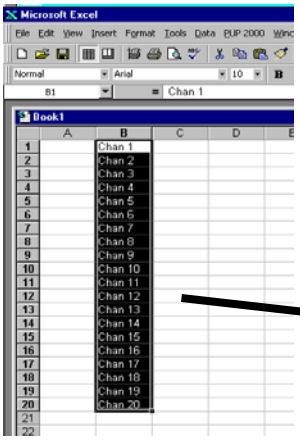
Paste

Since the Display Window uses a fixed grid, functions such as Append, Insert, Sort, Up, & Down are not available in this window.

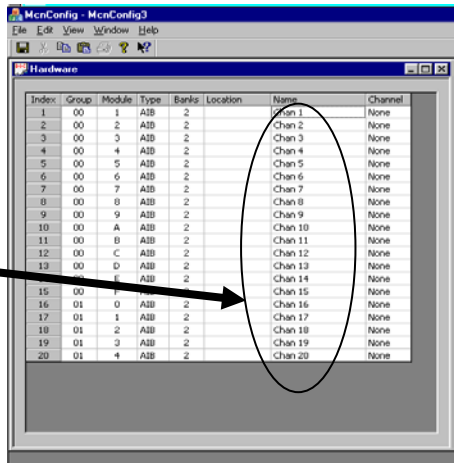
Using the Clipboard from other Applications

Many people keep system data in other applications, such as Excel. You can cut and paste some of this data from the other application into the MCNConfig program to save typing time.

Various fields in the MCNConfig system configuration files have special properties and thus have restrictions as to whether or not you can paste data from other applications or other windows. See the following section for restrictions.

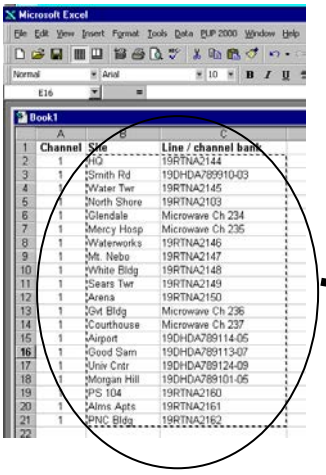


Copy (Ctrl-C) a column of Names in Excel

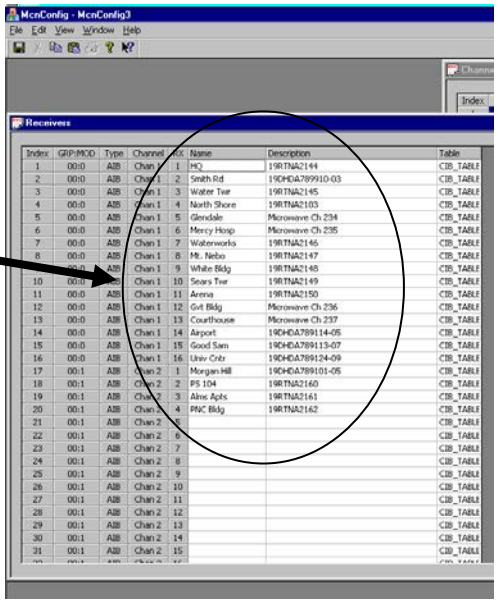


And Paste (Ctrl-V) them into the MCNConfig Hardware List

Or ….



Copy Receiver Site Names and Line Numbers from Excel



Into the MCNConfig Receiver List

Restrictions on Using the Clipboard

Various fields in the MCNConfig system configuration files have special properties and thus have restrictions as to whether or not you can paste data from other applications or other windows.

In all List Windows, any column that is highlighted in gray is a static column and cannot be changed in that window.

You cannot copy items into a drop-down field, except items from an identical drop-down field.

Module List Window:

Group Field	This field accepts only hex data from 00 to FE. You can paste data from the clipboard, but it must be hex data in this range. For every non-valid entry, you will see an error dialog box.
Module Field	This field accepts only hex data from 0 to F. You can paste data from the clipboard, but it must be hex data in this range. For every non-valid entry, you will see an error dialog box.
Type	This is a drop-down entry that limits the data to pre-defined hardware types. You cannot paste into this column.
Banks	Bank numbers are limited by the Module Type used. CIBs can have only 1 bank. AIBs can have up to 8. You can paste into this column for AIB modules. Each entry must be between 1 & 8. You will get a warning if you try to reduce the number of banks in an AIB.
Location	This is a free-format text field. You can paste text into this column.
Name	This is a free-format text field. You can paste text into this column.
Channel	This field allows entry of only channels defined in the Channel List window. You can cut & paste from one part of this column to another part. You cannot paste other types of data into this column.

Receiver List Window

Name	This is a free-format text field. You can paste text into this column.
Description	This is a free-format text field. You can paste text into this column.
Table	This field allows entry of only display tables defined in the Display Table window. You can cut & paste from one part of this column to another part. You cannot paste other types of data into this column.

Channel List

Channel	This is a free-format text field. You can paste text into this column.

Display Window (Screen Layout)

All Cells The cells require either:

-Left & Right Labels or

-Valid Receiver or other I/O Function Block References.

You can paste receivers from Receiver List window.

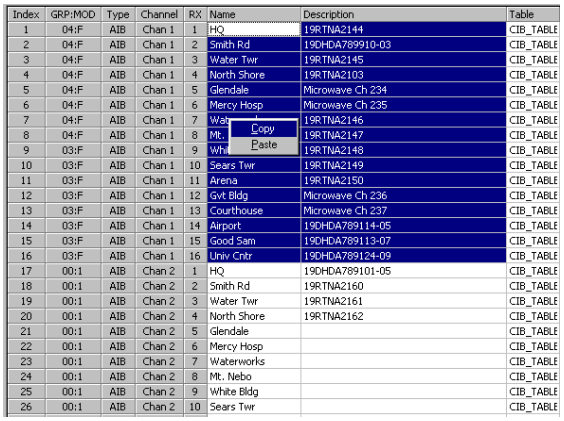
You can cut & paste a range of labels & receivers from a Display Window.

You cannot paste other types of data into these cells.

Pasting a Column of Receivers from the Receiver Window into the Display Window:

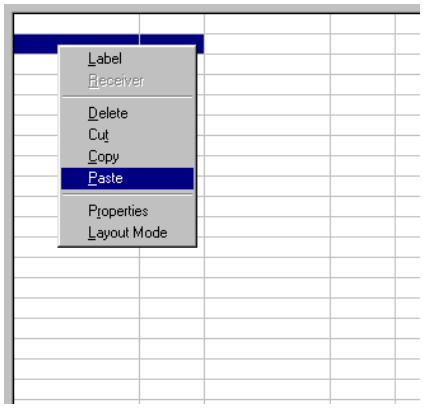
(Channels with a large number of sites)

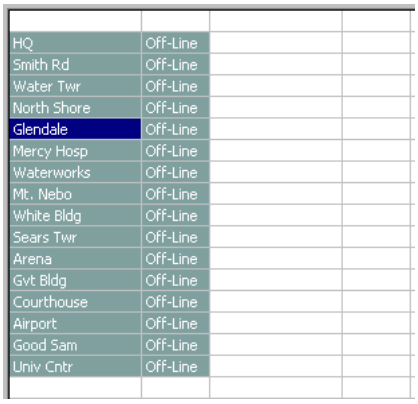
1. From the Receiver Window, highlight a group of receivers and Copy to clipboard.



Index	GRP:MOD	Type	Channel	RX	Name	Description	Table
1	04:F	AIB	Chan 1	1	HQ	19RTNA2144	CIB_TABLE
2	04:F	AIB	Chan 1	2	Smith Rd	19DHDA789910-03	CIB_TABLE
3	04:F	AIB	Chan 1	3	Water Twr	19RTNA2145	CIB_TABLE
4	04:F	AIB	Chan 1	4	North Shore	19RTNA2103	CIB_TABLE
5	04:F	AIB	Chan 1	5	Glendale	Microwave Ch 234	CIB_TABLE
6	04:F	AIB	Chan 1	6	Mercy Hosp	Microwave Ch 235	CIB_TABLE
7	04:F	AIB	Chan 1	7	Wat	19RTNA2146	CIB_TABLE
8	04:F	AIB	Chan 1	8	Mt.	19RTNA2147	CIB_TABLE
9	03:F	AIB	Chan 1	9	Whi	19RTNA2148	CIB_TABLE
10	03:F	AIB	Chan 1	10	Sears Twr	19RTNA2149	CIB_TABLE
11	03:F	AIB	Chan 1	11	Arena	19RTNA2150	CIB_TABLE
12	03:F	AIB	Chan 1	12	Gvt Bldg	Microwave Ch 236	CIB_TABLE
13	03:F	AIB	Chan 1	13	Courthouse	Microwave Ch 237	CIB_TABLE
14	03:F	AIB	Chan 1	14	Airport	19DHDA789114-05	CIB_TABLE
15	03:F	AIB	Chan 1	15	Good Sam	19DHDA789113-07	CIB_TABLE
16	03:F	AIB	Chan 1	16	Univ Cntr	19DHDA789124-09	CIB_TABLE
17	00:1	AIB	Chan 2	1	HQ	19DHDA789101-05	CIB_TABLE
18	00:1	AIB	Chan 2	2	Smith Rd	19RTNA2160	CIB_TABLE
19	00:1	AIB	Chan 2	3	Water Twr	19RTNA2161	CIB_TABLE
20	00:1	AIB	Chan 2	4	North Shore	19RTNA2162	CIB_TABLE
21	00:1	AIB	Chan 2	5	Glendale		CIB_TABLE
22	00:1	AIB	Chan 2	6	Mercy Hosp		CIB_TABLE
23	00:1	AIB	Chan 2	7	Waterworks		CIB_TABLE
24	00:1	AIB	Chan 2	8	Mt. Nebo		CIB_TABLE
25	00:1	AIB	Chan 2	9	White Bldg		CIB_TABLE
26	00:1	AIB	Chan 2	10	Sears Twr		CIB_TABLE

2 Go to the Display Window.
Move the cursor to the starting position for the column of receivers.
Paste the clipboard to the screen.





HQ	Off-Line
Smith Rd	Off-Line
Water Twr	Off-Line
North Shore	Off-Line
Glendale	Off-Line
Mercy Hosp	Off-Line
Waterworks	Off-Line
Mt. Nebo	Off-Line
White Bldg	Off-Line
Sears Twr	Off-Line
Arena	Off-Line
Gvt Bldg	Off-Line
Courthouse	Off-Line
Airport	Off-Line
Good Sam	Off-Line
Univ Cntr	Off-Line

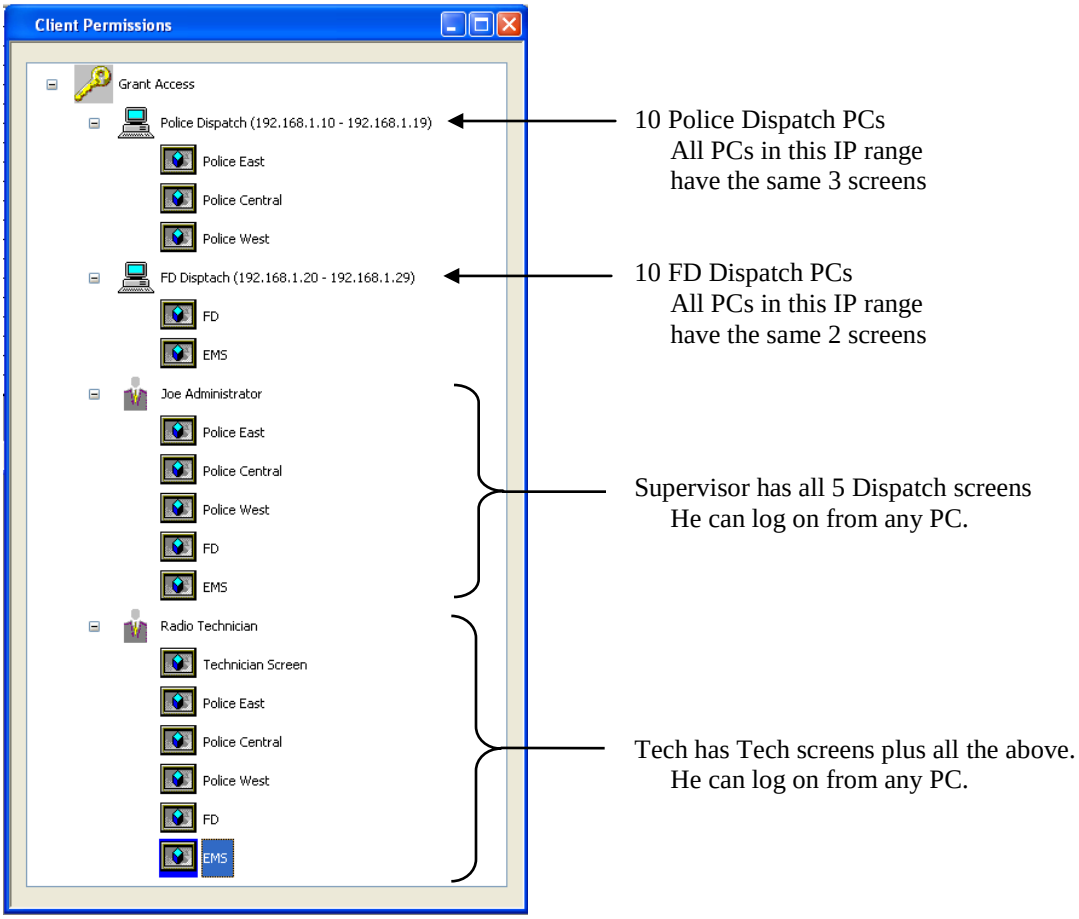
The receivers are pasted to the Display Window in a column.

MCNConfig Program: Client Permissions

If you have multiple client PCs and users, you can select which screens they will be able to use with the Client Permissions configuration. For example, you could set up the following restrictions:

User	**Screens Allowed**
PD Dispatch	Police East Police Central Police West
FD Dispatch	FD EMS
Supervisor	All the PD & FD Dispatch screens
Technician	All the above screens plus special Technician screens

The following shows the Client Permissions window for the example above.



Screens can be restricted based on:

- User Name
- PC IP Address Range
- A combination of both User Name & PC IP Address Range

The above example shows a fairly simple system. You can develop even more complex Client Permissions.

Client Restriction Rules

Normally, in an MCN Client-Server system, all clients can access all screens. The Client Permission function works by taking away rights. The following are the rules for Client Permissions:

Initial Configuration – Unrestricted Client Permissions

When building a new system or loading older system configuration files without permissions, Unrestricted Client Permissions will take effect. The top key icon will have a label saying "Unrestricted Access" on it. If you don't want to restrict the screens available to specific users or PCs, you don't have to modify the Client Permissions. Unrestricted Client Permissions means:

1. Users can log on from any PC at any IP address that can access the server over IP.
2. All user names will be accepted.
3. All users on all PCs can access all screens.

PC Configuration

1. If a PC (or range of PCs) is not listed with restrictions, it will be able to access all screens.
2. PCs can be added at the first level (root) of the tree.
3. Each PC icon can have a range of IP addresses. The screens authorized under that PC icon will pertain to all PCs in that IP address range.
4. Each PC icon must have a unique IP address range. It cannot overlap with the IP address range of any other PC icon.
5. When a PC icon has no screens or users under it, it has access to all screens. The label for the PC will show "All Screens".
6. A PC icon with screens or users below it will have restricted access.
7. When a PC icon is first added, it will All Screens access.

User configuration

1. Master Users are added at the first (root) level.
2. Sub Users can be added under one or more PC icons.
3. Master Users can also be added as Sub Users under PC icons.
4. When a User icon has no screens under it, it has access to all screens. The label for the User will show "All Screens".
5. A User icon with screens below it will have restricted access.
6. When a User icon is added (either as a Master User or a Sub User), it will have All Screen access.

Screens

1. Screens can be entered under either:
   - Master User icons

- PC icons
- Sub User Icons

2. Screens may be entered under more than one icon.

Client Access Rights

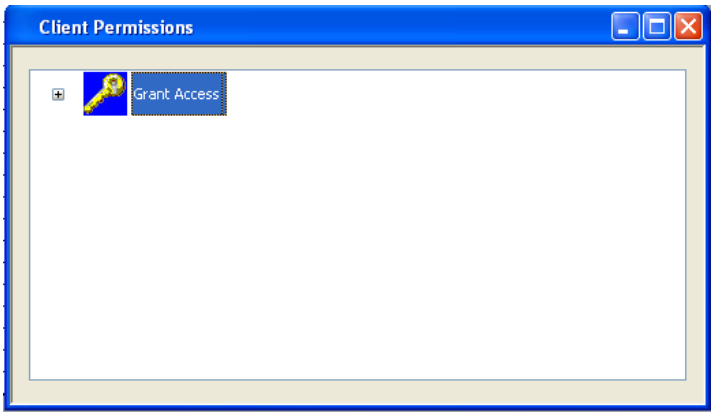
1. Master Users can access the system from a PC with any IP address (not just the address ranges associated with the PC icons).
2. If a user logs on to a PC that has either All Screens access or screens directly under its icon, that user can access those screens.
3. Sub Users can access the system only from PCs under which they appear.
4. The Server program will reject any unauthorized log-on attempt.

Client Screen Rights

1. Screens listed under Master User icons will be available to that user, no matter what PC he uses to log on. If a Master User has "All Screens access, he can access all screens from any PC.
2. Screens listed under PC icons will be available to any user logged on through that range of PCs.
3. Screens listed under a Sub User icon will be available to that user logged on to that range of PCs.
4. Screen rights are cumulative:
   A Sub User will have access to any screens under his icon plus any screens authorized for his parent PC icon.

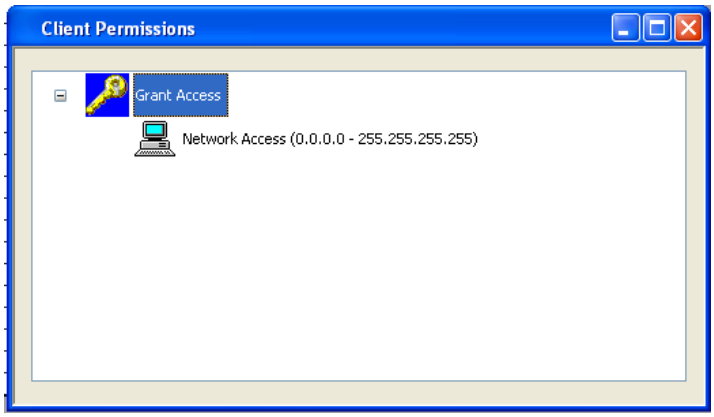
   If a Master User logs in from a PC within the IP range of one of the PC icons, he will have access to all screens under his Master User icon plus all screens authorized to that PC icon.

From the **View** menu, select ***View Client Permissions.***

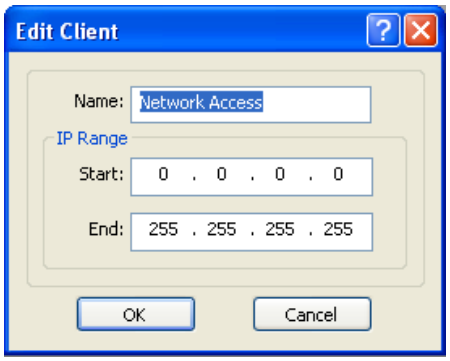


The initial Client Permissions screen is blank, with no restrictions for any users or PCs.

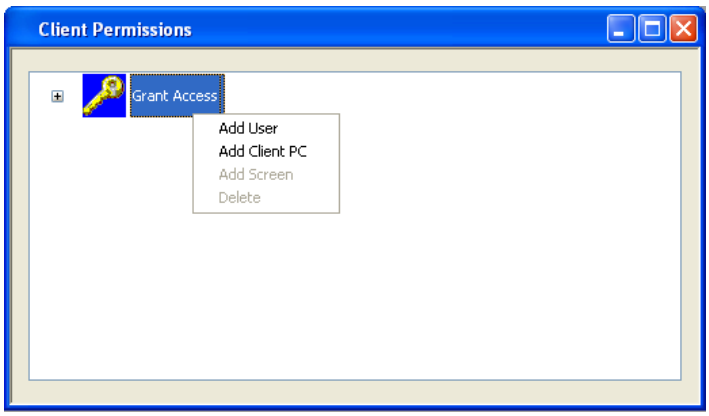
Pressing the "+" gives you:



When you first build the system, access rights are granted to all PCs in the system as represented by the Network Access icon above. If you want to restrict access by IP address, click on the

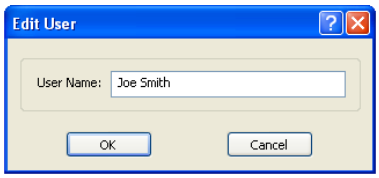


To add a User or Client PC, Right-Click on the Grant Access icon.
Select **Add User** or **Add Client PC** from the menu.

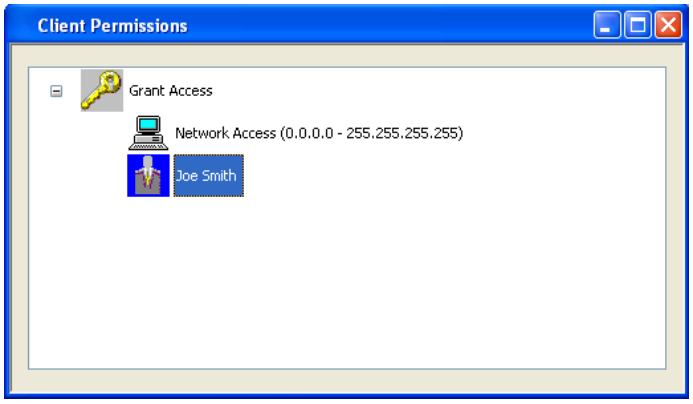


Add User

The **Add User** function lets you add an authorized user.



Enter the user name and hit OK.



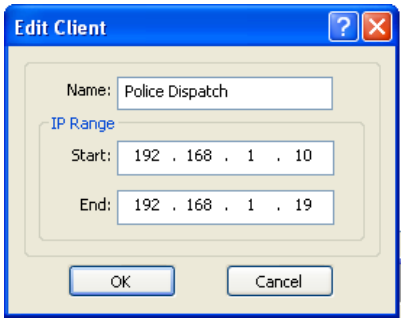
The user will be added in the Permissions Tree under the icon you first selected.

In the case above, the user is added under the root. This makes him a Global User. He will be allowed to access the Server from any IP address that can reach the server.

Users can also be added as local users under specific PCs.

Add PC(s)

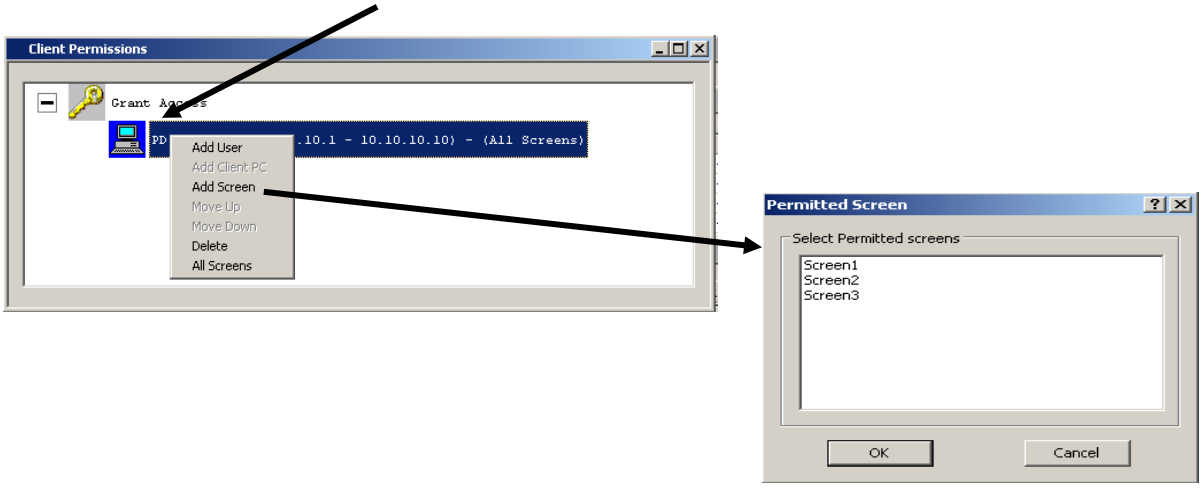
The **Add PCs** function lets you add a series of authorized Client PCs by using an IP address range. This allows you to assign the same rights to all PCs in the range. For example, you could set up two ranges, one for Police Dispatch and one for FD Dispatch:



Add Screen

Screens can be added under PCs or Users.

Right Click on a PC or User icon and select "Add Screen"



Select a screen from the list.

Windows User Names Note

Note that User Name is the Windows User name that was originally established for an account. If the User name is changed, Windows still reports the original User Name to the MCNRCD Server program.

Network and System Security Note

The Client Permission feature of the MCNRCD Server is intended to help organize screens for clients on a closed network. It is intended to be used in large systems with multiple screens to limit the screens available to dispatchers to the actual screens that pertain to that dispatcher, thus eliminating confusion.

The Client Permission features is not intended to provide network or system security. Network and system security to prevent access to the Client and Server PCs by unauthorized users should be addressed by the customer through standard methods.

Since screen selection is based on the Client PC's IP address and the Windows User Name, users should be configured without administrative rights. This will prevent them from adding user accounts or changing their IP addresses.

MCN Server 8000 Program

This is the software run on the MCN Server PC. It has a local display that displays the status of the devices on the MCN system (Comparators, I/O points, alarms, etc.). It allows the operator to control receivers (with Force-Vote and Disable functions) and other I/O devices (relays, etc.) from the MCN Server PC.

The MCN Server program also passes the status and control data to MCN Client PCs over an IP LAN or WAN.

First Time Setup

The MCN Server program needs to set up a number of parameters before it can function. When you run the software for the first time, it will ask you to enter some values.

Software Key

A Software Key is furnished with each MCN Server software package. It is entered in the HW Setup program. It includes the licensed feature set for the system and some identifying information that helps us provide product support. Each Software Key is locked to the Security Hardware Key that was shipped with the system.

The following features are encoded into the Software Key:

- Expiration Date
- Authorized software major version numbers
- Maximum number of Clients that can be active at one time (Overall)
- Maximum number of legacy Network Interfaces (HIB-IP modules, PCLTAs, etc.)
- Maximum number of IP Comparators (GCM 8000 and MLC 8000 Analog Comparator)

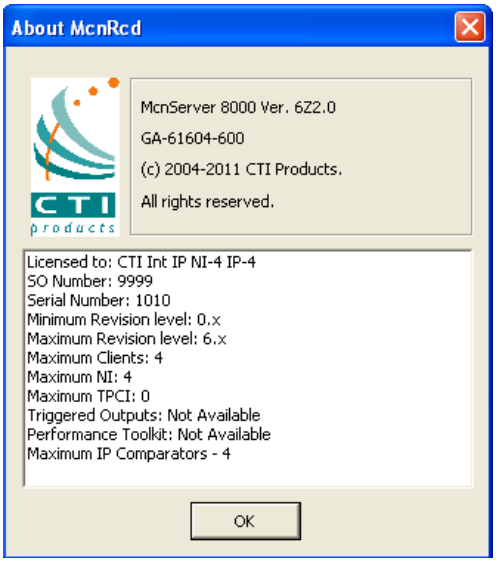
If you have entered an invalid software key (or it doesn't match the Security Hardware Key), the MCN Server software will bring up an error window when it starts up.

Re-Entering a Software Key

If an error is made when entering the Software Key, you can re-enter it using the HW Setup program or you can change it from within the MCN Server Program by clicking Software Key under the Help Menu.

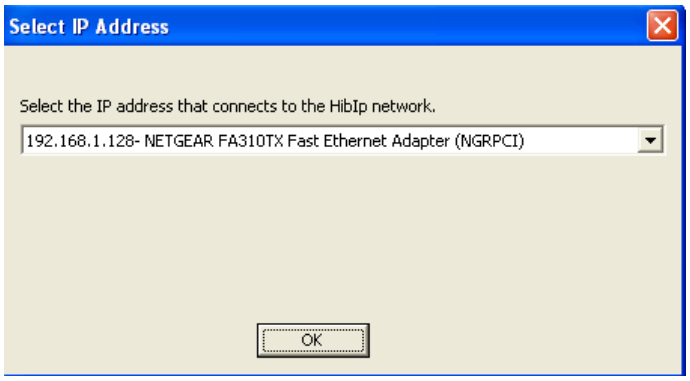
Viewing the Licensed Features:

After the program is running, you can use the Help About menu item to check which features are enabled in your system.



Selecting an Ethernet NIC to talk to the HIB-IP (and HIB-IP 8000) units

Next, the program needs to know which Ethernet NIC card will be used to talk to the HIB-IP units. The **Select IP Address** window appears and asks you to select an IP address (associated with a NIC card in your PC) that you will use to talk to the HIB-IP units.

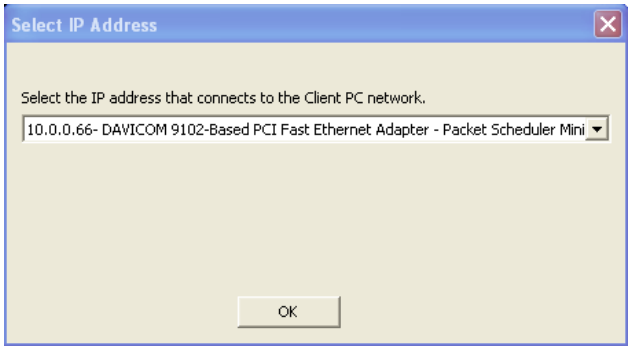

Select IP Address
Select the IP address that connects to the HibIp network.
192.168.1.128- NETGEAR FA310TX Fast Ethernet Adapter (NGRPCI)
OK

Select an IP address and NIC card using the drop-down list. There will be an entry for each combination of IP addresses and NIC cards in your PC. If you have only one NIC card, you will probably have only one entry.

The program will ask for this information even if you don't have any HIB-IP units in your system. Humor the program and select an IP address and NIC card anyway.

Selecting an Ethernet NIC to talk to the MCN Client PCs

The program then needs to know which Ethernet NIC card will be used to talk to the MCN Client PCs. The **Select IP Address** window appears and asks you to select an IP address (associated with a NIC card in your PC) that you will use to talk to the Client PCs.


Select IP Address
Select the IP address that connects to the Client PC network.
10.0.0.66- DAVICOM 9102-Based PCI Fast Ethernet Adapter - Packet Scheduler Mini
OK

Again, select an IP address and NIC card from the drop-down list.

Dual NIC Restrictions in ASTRO® 25 RNIs

Use of multiple NIC cards (Dual-Home systems) is not approved by MSI in ASTRO® 25 RNIs due to Information Assurance (IA) security concerns.

Microsoft Windows IP Address Restrictions – Server to Client

Because of operating systems in Windows Vista and above, the MCN Server 8000 software will not support system with multiple IP addresses on the NIC card that communicates to the Client. The link to the clients must use a NIC card that has only one IP address programmed.

Windows Firewall

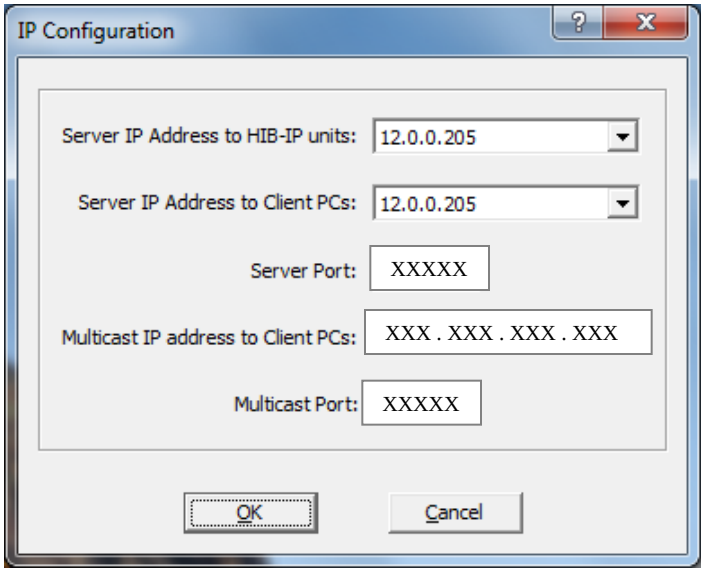
The MCN Server application needs to access the LAN/WAN. If you have the Windows Firewall enabled, you will need to give the MCN Server program access.

Windows Security Alert
To help protect your computer, Windows Firewall has blocked some features of this program.
Do you want to keep blocking this program?
Name: MCN Remote Comparator Display
Publisher: CTI Products
Keep Blocking
Unblock
Ask Me Later
Windows Firewall has blocked this program from accepting connections from the Internet or a network. If you recognize the program or trust the publisher, you can unblock it. When should I unblock a program?

Select the **Unblock** option.

Setting IP Parameters

The program will open the IP Configuration window.



Hint

If you need to change these IP settings later, use the **Options / IP Settings** menu item to open this window.

Use the default settings for the last three fields.
Enter the proper parameters.

This window has the following fields:

Server IP Address to HIB-IP units
This is the IP address of the NIC (in the PC) that you want to use to talk to the HIB-IP units.

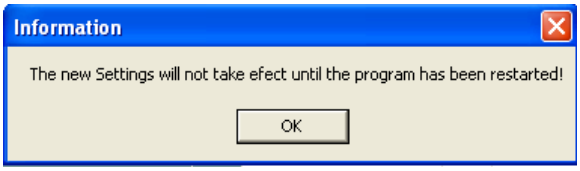
Server IP Address to Client PCs
This is the IP address of the NIC (in the PC) that you want to use to talk to the MCN Client PCs.

Server Port
This is the Port number in the MCN Server PC to which the MCN Clients connects.
Use the default value for ASTRO® 25 7.12 (and up) systems.

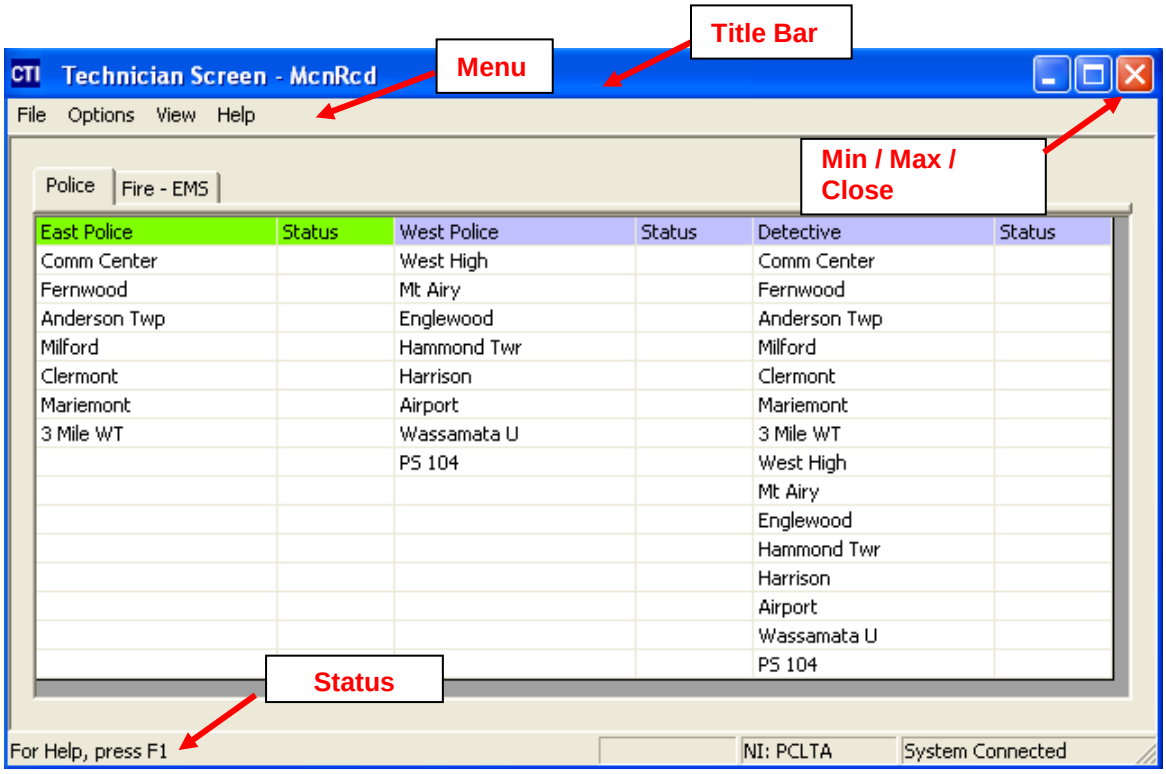
Multicast IP to Client PCs
This is the Multicast IP address that the MCN Server PC uses to send the real-time status data to the Clients. Use the default value for ASTRO® 25 7.12 systems for:
Server 1, Zone 1, Main Prime site.
If your system configuration is different, please refer to the Motorola IP Plan document for the proper Multicast IP address. .

Multicast Port
This is the destination UDP Port number for the real-time Multicast traffic from the MCN Server PC to the Clients. Use the default value for ASTRO® 25 7.12 systems.

You must re-start the MCN Server program after you change IP parameters.



Screen Elements



Controlling the MCN Server Window

You can control the MCN Server window using standard Windows techniques as follows:

Move the window by grabbing its title bar and dragging it.

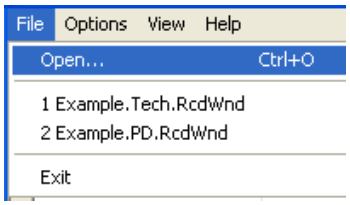
Re-size the window by grabbing an edge or corner and dragging it.

Minimize /Restore, Maximize and **Close** the window using the standard Windows buttons on the top right corner of each window.

Menus

This program has many standard menu functions that are used in other Windows programs. For example, menus can be selected with the mouse or by hitting the ***ALT*** key & the underlined letter on the menu. Note that a menu's appearance may change, and various menu options may be disabled, depending on the current state of the system.

File Menu



Open — Opens a Display Window created in the MCNConfig program.

Recent Files — Allows you to quickly open a recently used Display Window.

Exit — Exits the program.

Options Menu

Logging & Sound — Allows the user to control which logging methods are active.

Printer Setup — Printer parameters must be entered before alerts are sent to a printer.

Font — Used to change the Font type or size for the display grid.

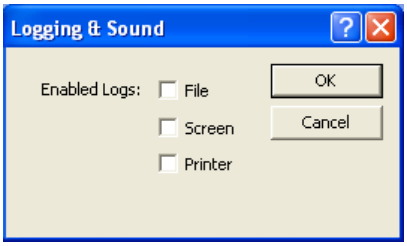
IP Settings — Lets you select the appropriate NIC card IP address to use to communicate with HIB-IP modules, IP comparators and Client PCs. It also lets you select the appropriate UDP Port numbers for the MCN Server.

See the Setting IP Parameters section on page ***129*** for details.

Enabling & Disabling Logging

Alerts generated by the MCN Server program can be sent to the PC screen, printer or logged to a log file. Alert sounds can also be enabled.

The following window will be displayed when ***Logging & Sound*** is selected from the Options Menu.



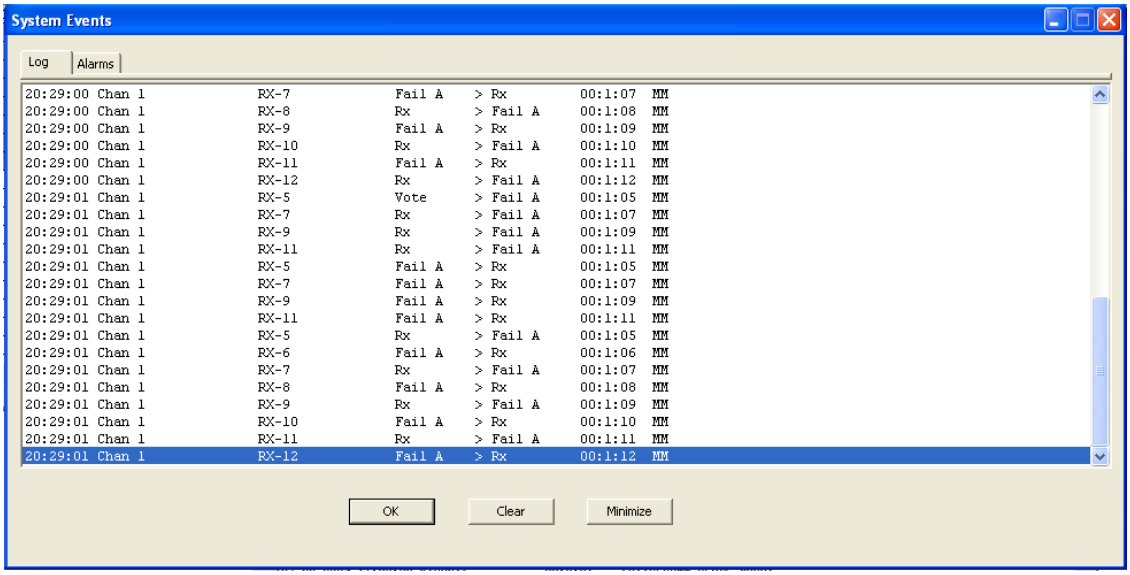
Select the types of logging required, then click the **OK** button.

If logging to ***File*** is enabled, the file is named ***MCNRCD.log*** and is located in the MCN Server system directory. This is normally at:

c:\ProgramData\CTI Products Inc\McnRcd

Screen Logging – Log Window / Log Tab

When Screen Logging is enabled, status changes will be listed on the System Events window in the Log tab as shown below.

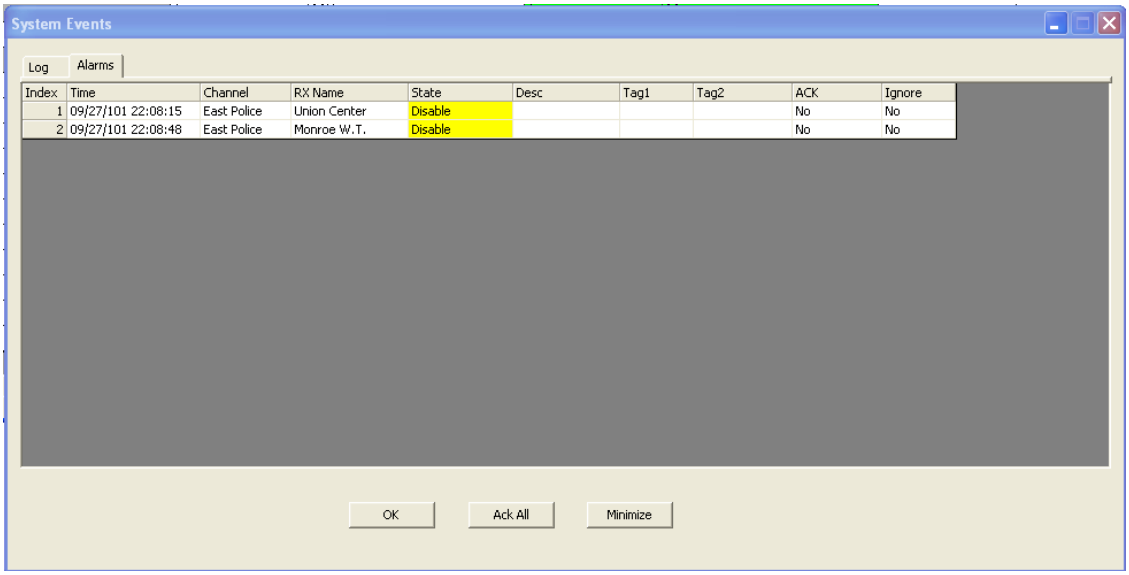

System Events
Log
Alarms
20:29:00 Chan 1 RX-7 Fail A > Rx 00:1:07 MM
20:29:00 Chan 1 RX-8 Rx > Fail A 00:1:08 MM
20:29:00 Chan 1 RX-9 Fail A > Rx 00:1:09 MM
20:29:00 Chan 1 RX-10 Rx > Fail A 00:1:10 MM
20:29:00 Chan 1 RX-11 Fail A > Rx 00:1:11 MM
20:29:00 Chan 1 RX-12 Rx > Fail A 00:1:12 MM
20:29:01 Chan 1 RX-5 Vote > Fail A 00:1:05 MM
20:29:01 Chan 1 RX-7 Rx > Fail A 00:1:07 MM
20:29:01 Chan 1 RX-9 Rx > Fail A 00:1:09 MM
20:29:01 Chan 1 RX-11 Rx > Fail A 00:1:11 MM
20:29:01 Chan 1 RX-5 Fail A > Rx 00:1:05 MM
20:29:01 Chan 1 RX-7 Fail A > Rx 00:1:07 MM
20:29:01 Chan 1 RX-9 Fail A > Rx 00:1:09 MM
20:29:01 Chan 1 RX-11 Fail A > Rx 00:1:11 MM
20:29:01 Chan 1 RX-5 Rx > Fail A 00:1:05 MM
20:29:01 Chan 1 RX-6 Fail A > Rx 00:1:06 MM
20:29:01 Chan 1 RX-7 Rx > Fail A 00:1:07 MM
20:29:01 Chan 1 RX-8 Fail A > Rx 00:1:08 MM
20:29:01 Chan 1 RX-9 Rx > Fail A 00:1:09 MM
20:29:01 Chan 1 RX-10 Fail A > Rx 00:1:10 MM
20:29:01 Chan 1 RX-11 Rx > Fail A 00:1:11 MM
20:29:01 Chan 1 RX-12 Fail A > Rx 00:1:12 MM
OK
Clear
Minimize

- Hitting the OK button will close the window but keep the log entries.
- Hitting Clear will delete the log entries.

You can view the Log & Alarm window later by selecting **View / Log Window** from the menu.

Alarm Display – Log Window / Alarms Tab

If a Receiver or I/O point is configured for Alarm operation, it will be displayed on the Alarms tab of the Log window when it goes into an Alarm state.



This tab shows all alarms which are:

- Active and/or
- Unacknowledged.

The state shown will be the state at the time the alarm became active. It does not necessarily show the current status.

If an alarm state has a sound configured for it, that sound will be played when a point goes into the alarm state. For multiple alarms, the alarm sound will not be repeated unless 2 seconds has elapsed since the previous alarm.

Alarms must be acknowledged. They can be acknowledged with either:

- The **Ack All** button or
- The Ack drop-down field in the individual alarm line.

Alarms will be removed from the window when:

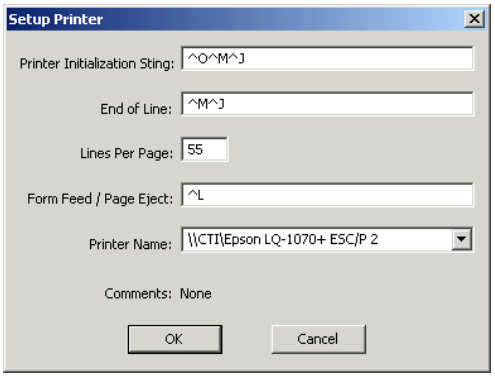
- The alarm is acknowledged and
- The state returns to normal

If there is a nuisance alarm, it can be placed on Ignore status with the Ignore field.

Receivers and I/O points can be configured for Alarm operation by selecting an appropriate Display Table. Alarm activity can also be enabled on an existing Display Table. See the States Tab section starting on page ***155*** for instructions on how to enable alarms and sounds in the Display Tables.

Printer Setup

For alerts to be printed, printer parameters must be provided in the following screen. To display this window, choose “Printer Setup” from the Options Menu.

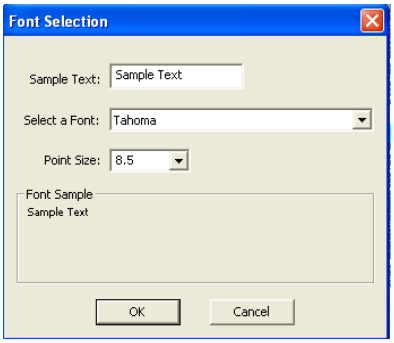


Parameters in the above window can be obtained from the specific printer documentation.

Printer Initialization String	This Escape character sequence is sent to the printer at the start of a new print job. In the example above, ^O instructs the printer to print without using a bottom margin, since continuous paper will be used. ^M selects 10.5 points for the font height and 12 characters per inch horizontally. And ^J specifies the line feed distance.
End of Line	This Escape character sequence is sent to the printer after each line of print. Normally, this should consist of escape characters for “line feed” and “carriage return”.
Lines per Page	Enter the number of lines to be printed on each page.
Form Feed/Page Eject	This Escape character sequence is sent to the printer after the number specified in “Lines per Page” above have been printed on a page.
Printer Name	A drop-down list is provided to select from the installed printers on this PC.

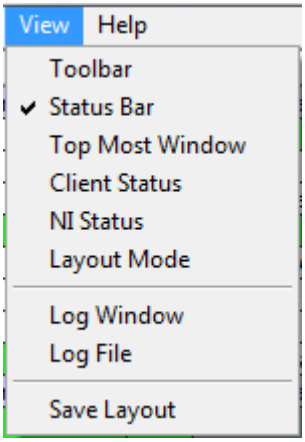
Font

The Font Selection window is used to select a font and a font size for the Receivers and Function Blocks in the Display Window.



The row sizes will automatically stretch or shrink in response to font size changes. You may have to change the column widths manually after you make a change.

View Menu



Toolbar — When checked, enables the Toolbar.

Status Bar — When checked, enables the Status Bar (at the bottom of the MCN Server display window).

Top Most Window — When checked, ensures that the MCN Server display window is always the Top-Most Window.

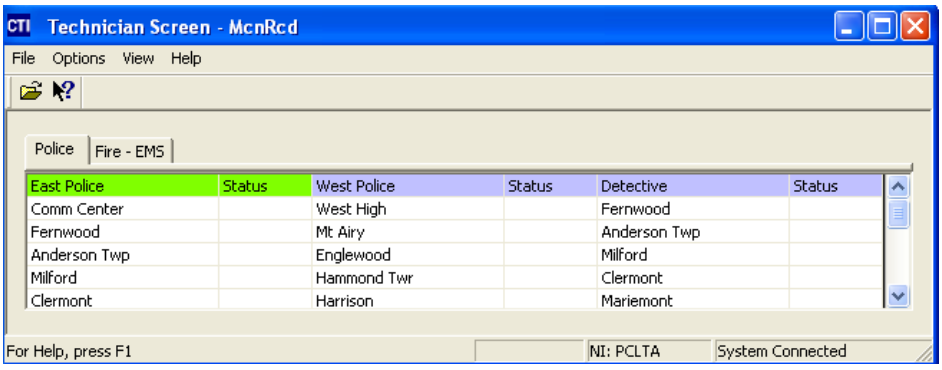
Client Status — Opens the Client Status window to display the status the client PCs currently logged into the MCN Server.

NI Status — Opens the Network Interface Status window to display the status of all Network Interfaces in use by the MCN Server.

Layout Mode — When checked, allows column widths to be adjusted, "Layout Mode" will be indicated in the Status Bar (at the bottom of the MCN Server display window).

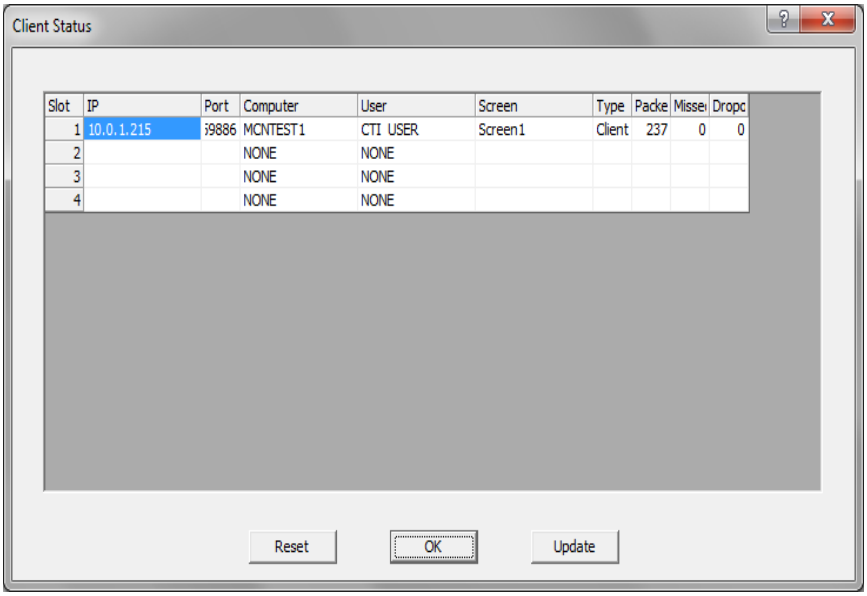
Save Layout — Use this command to save column width changes performed when in Layout Mode.

The following figure shows the Toolbar and Status Bar enabled.



Client Status Window

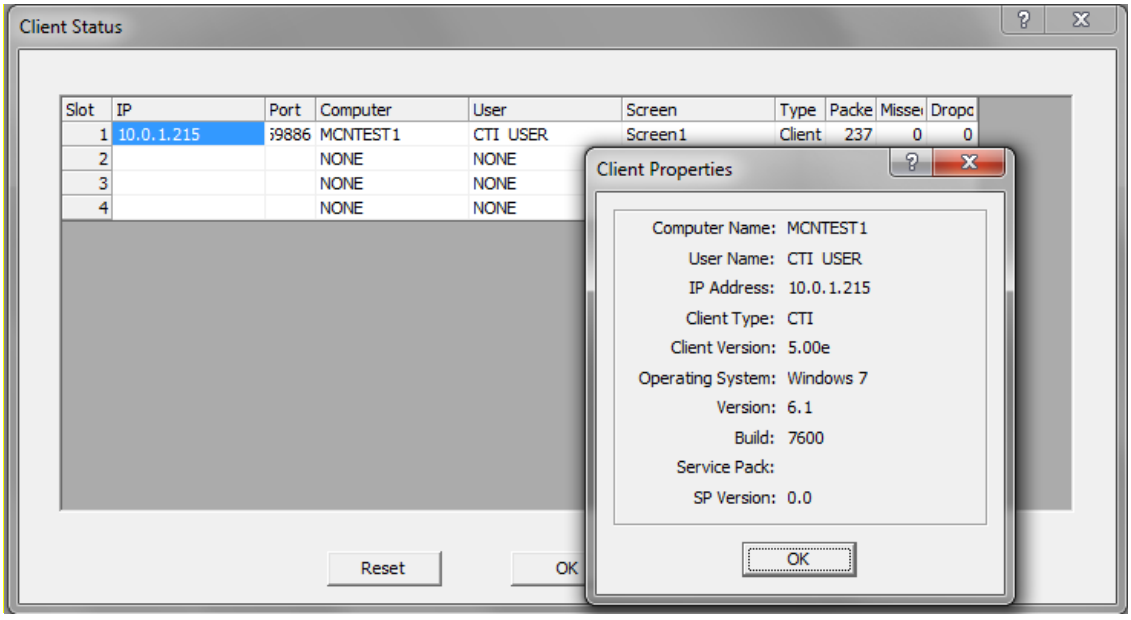
The Client Status window will show which clients are logged into the MCN Server program. It will also indicate whether they are TPCI clients or not. (TPCI is supported in the Advanced Server software only.)



To get more detail on a Client, double-click on one of the Client lines to bring up the Client Properties Window

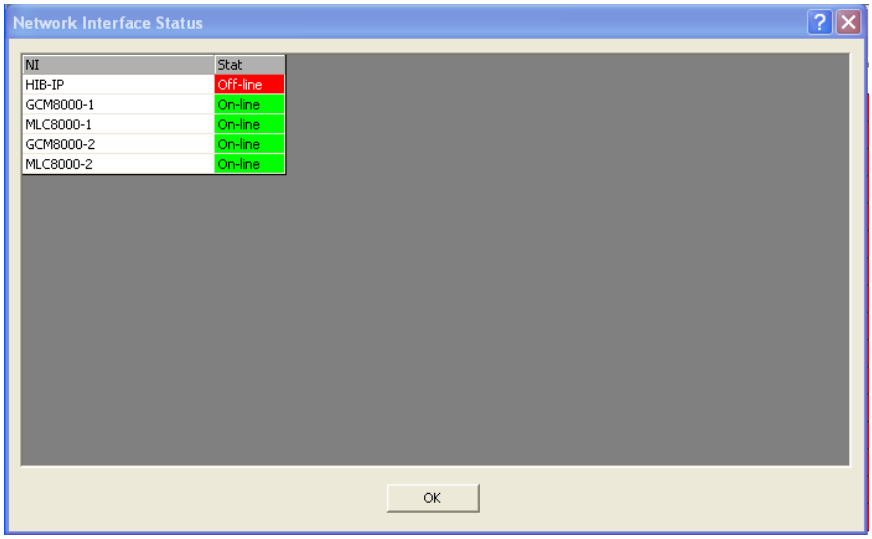
Client Properties Window

The Client Properties window displays detailed information on the selected client.



NI Status Window

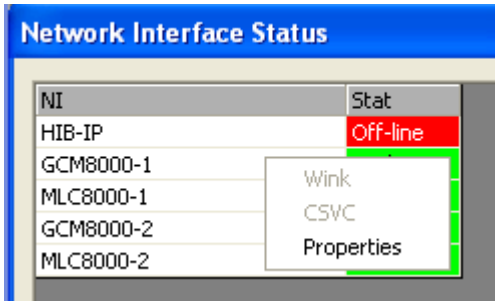
The NI Status Window shows the status of the Network Interfaces associated with this system.



For Mixed Mode systems, there will be individual entries for the GCM 8000 and the MLC 8000 Analog Comparators.

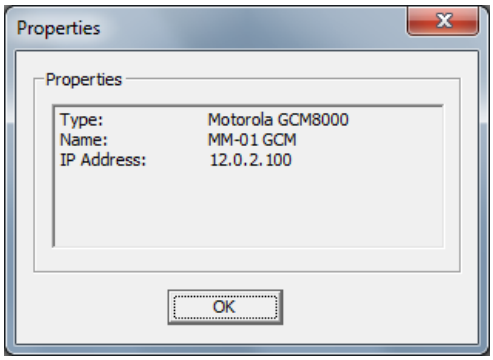
Network Interface Properties Display

For additional information on the Network Interface, right-click on the selected Network Interface and select the Properties menu item.

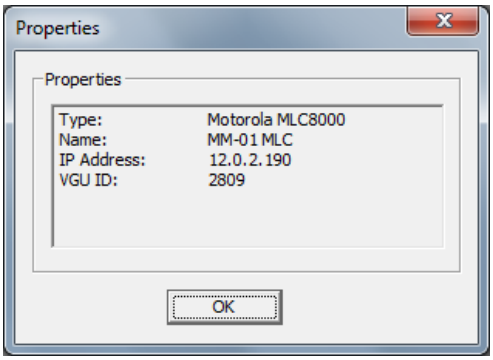


The Properties will vary, depending on what type of Network Interface is in use.

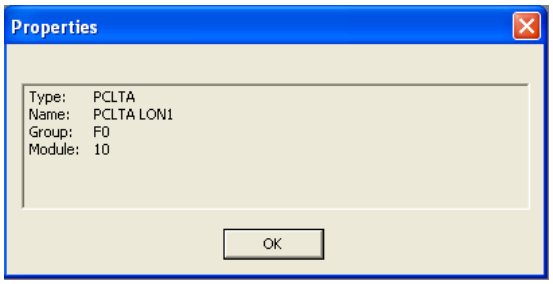
GCM 8000 Properties



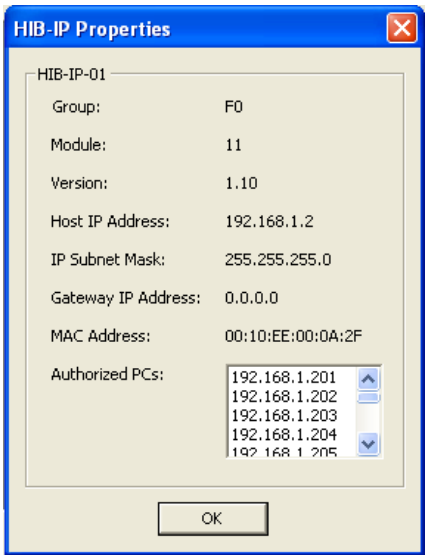
MLC 8000 Properties



PCLTA Properties

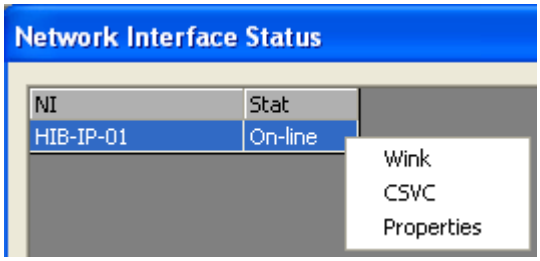


HIB-IP Properties



Additional HIB-IP Diagnostic Functions

When you Right-Click on a HIB-IP Network Interface, you have two additional diagnostic options: Wink and CSVC.

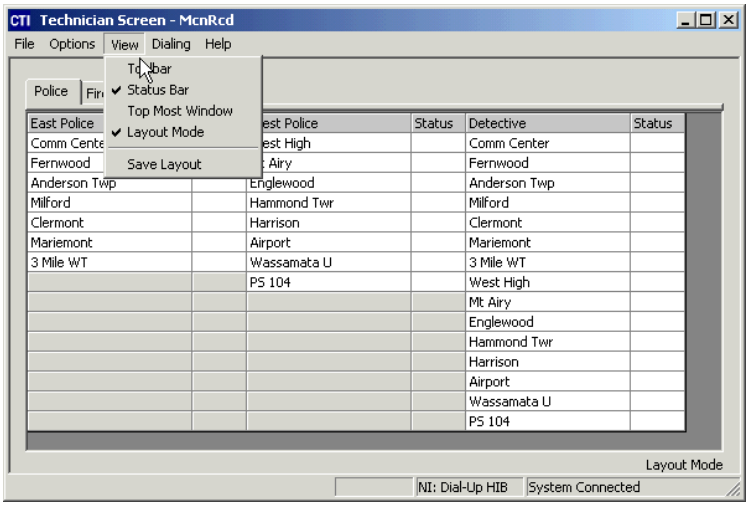


Wink This will blink the "Wink" LED on the front of the HIB-IP unit.
This can be helpful to identify a HIB-IP unit when you are using Advanced Server software with multiple HIB-IP units.

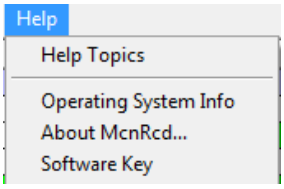
CSVC This is the equivalent of pressing the CSVC button on the front of the HIB-IP unit.
In special instances, a CTI engineer may instruct you to click on the CSVC function.

Layout Mode

The following figure shows the MCN Server Display Window in Layout Mode.

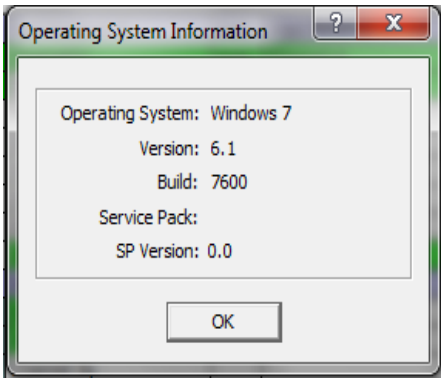


Help Menu



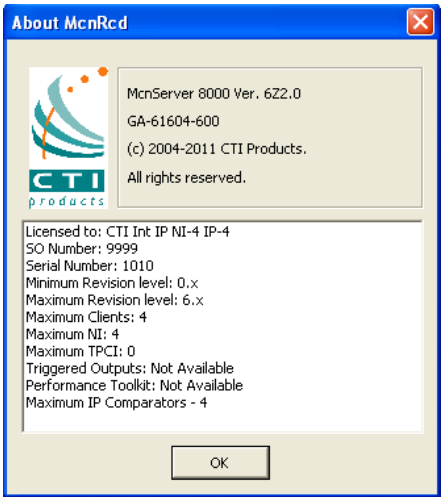
Operating System Info

The operating system info will display relevant details about the OS on which the MCN Program is installed.



About McnRcd…

The ***About McnRcd*** menu item, will display relevant details about the currently installed license options for the McnServer 8000 Program.



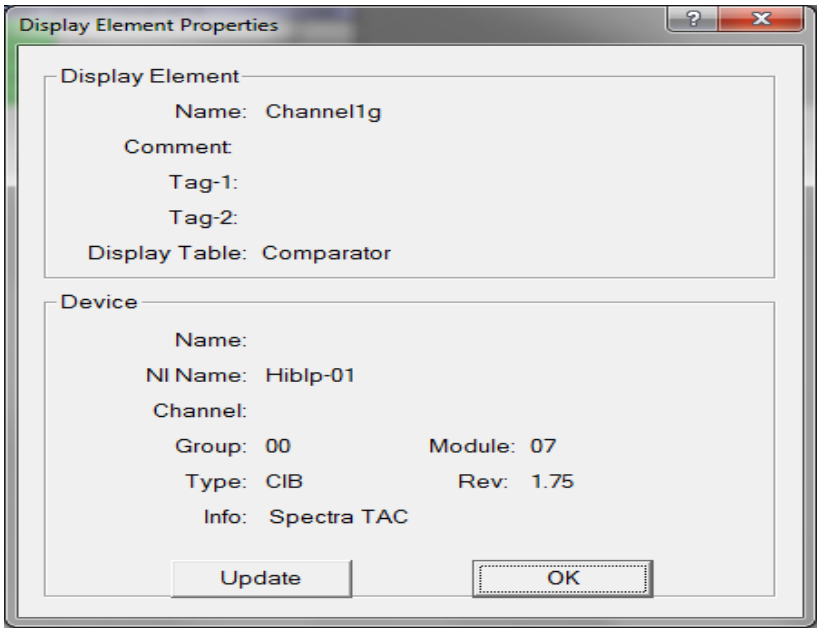
Note that Each GCM 8000 and MLC 8000 Analog Comparator counts as one IP comparator, even if they are operating in a Mixed Mode system.

Software Key Menu Item

The ***Software Key*** menu item opens the Software Key dialog box to allow you to load a new Software Key. See the Software Key section on page ***26*** for details.

Display Element Properties

More information can be obtained about each specific receiver by performing a **Shift - Left Click** over the particular screen element and bringing up the Display Element Window.



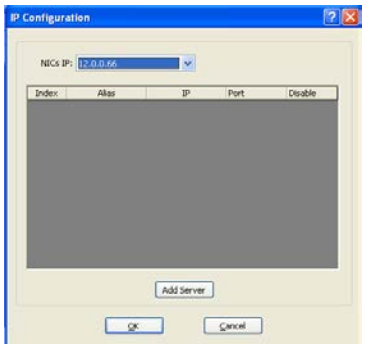
MCN Client Program

This is the Client program that operates on remote PCs to display the status of and control the MCN system. The MCN Client program operates on PCs connected to the MCN Server over an IP network, and thus do not need their own MCN Network Interface.

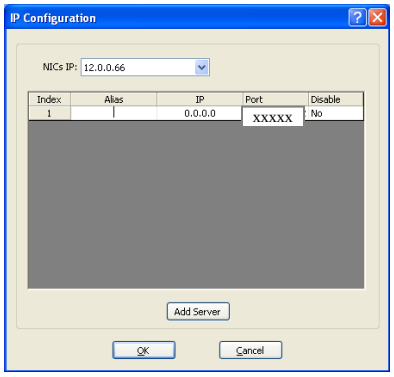
Note: Use elevated rights when running the Client program the first time
The Client program uses a list of MCN Servers to contact. This is normally set up once, the first time the Client program is run. For security purposes, it is recommended that normal users have only read-only access to the Server List. If you have set up the system this way, you must have Administrator rights to run the Client program the first time (to enter the Server List). Right-click on the program and select "Run As Administrator" to elevate your rights. If users have proper Read-only rights, they can then run the Client program with User permissions.

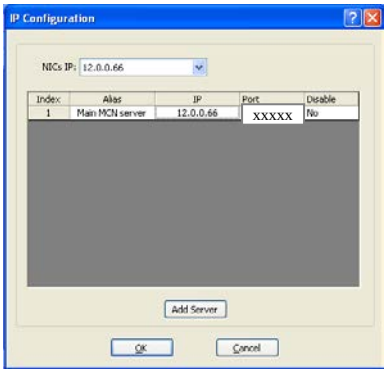
Selecting IP Parameters & Server List

When you start the MCN Client program for the first time, it will ask for the IP parameters to use to connect to the MCN Server.



1. In the NICs IP drop-down box, select the IP address of the Client's NIC to use to connect to the MCN Server. (Normally there will be only NIC card and one IP address set up in a PC.)
2. Hit "Add Server".

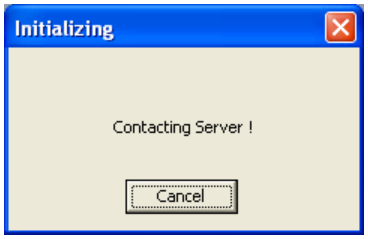




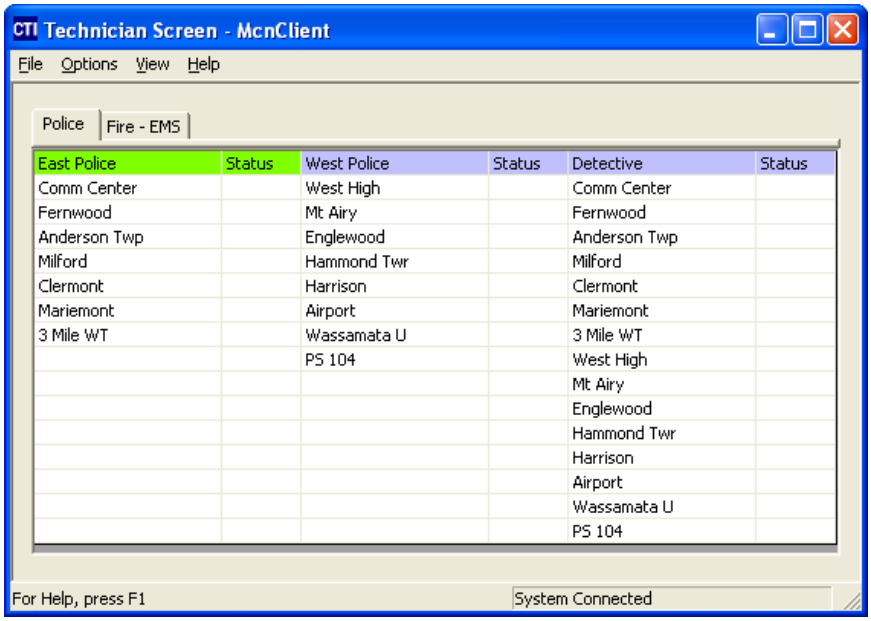
3. Enter an Alias for the Server, its IP address and MCN UDP port number.
   Use the IP address and Port that were assigned and set up on the MCN Server
   Make sure Disable is set to "No".
4. If you have backup servers, add them by repeating the above steps
5. Hit OK.
6. The list of clients will be saved in a file: ServerList.RcdCli and will be used the next time the Client is started.

Making Connection with the Server

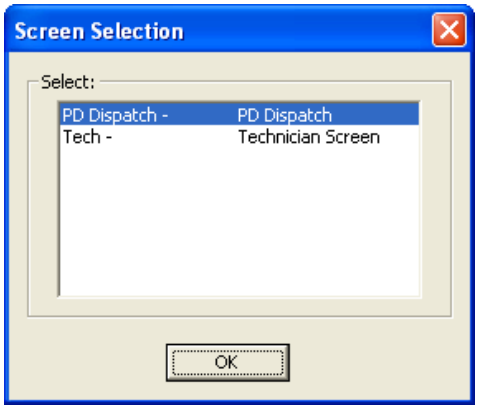
As the MCN Client program starts, it will try to contact the MCN Server.



If the MCN Client program has been run on this PC before, it will load and display the last loaded screen.

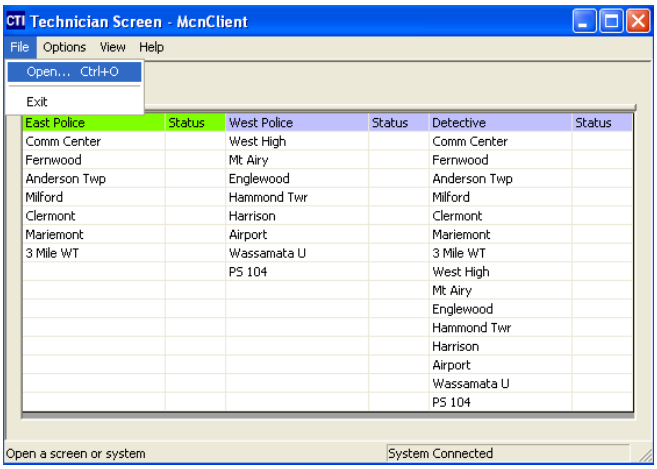


If it is the first time the MCN Client program is run, it will contact the MCN Server PC to get a list of available screens. Select from one of the screens.

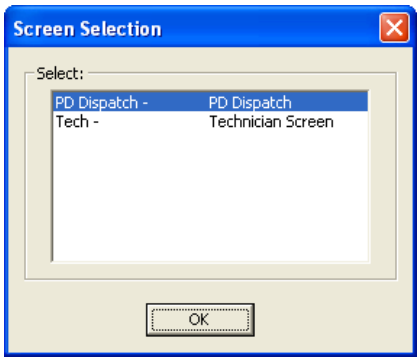


Selecting Screens

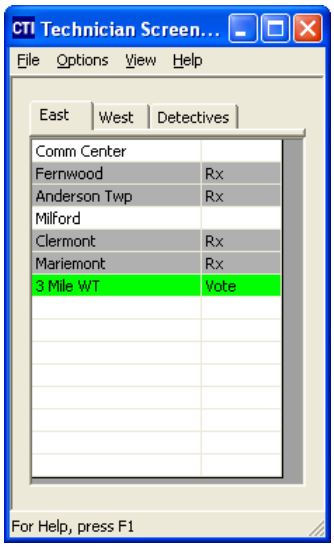
To load a different Display Window (screen), go to the File ... Open menu item.



A list of available screens will be displayed.



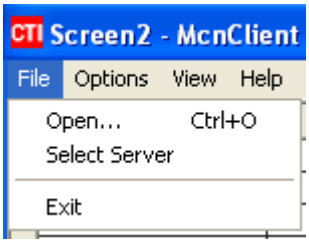
Select the desired screen from the list and it will be opened:



File Menu

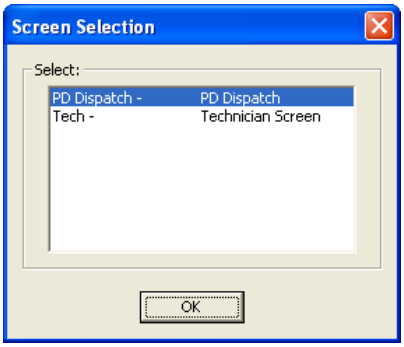
The File menu has the following menu items

Open	Allows you to select a new screen on the current server.
Select Server	Allows you to select a different server (if there is one)
Exit	Allows you to exit the program

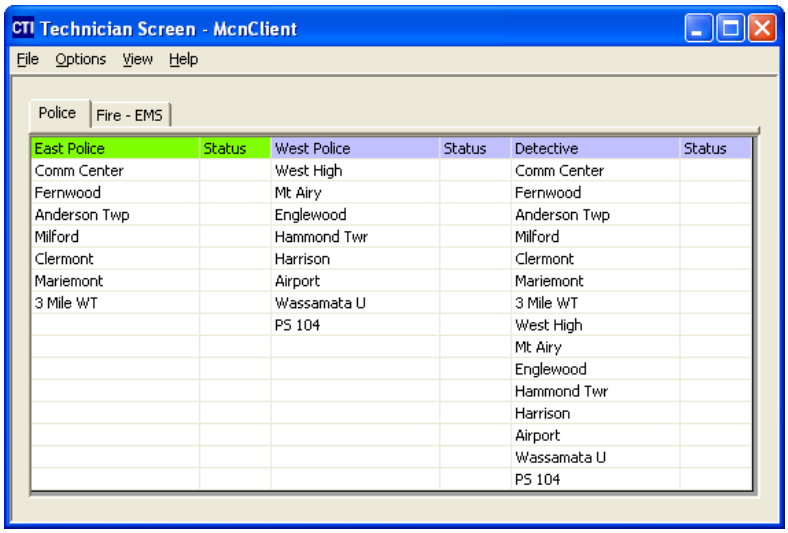


Open

The Open window presents a list of screens present on the current MCN Server.

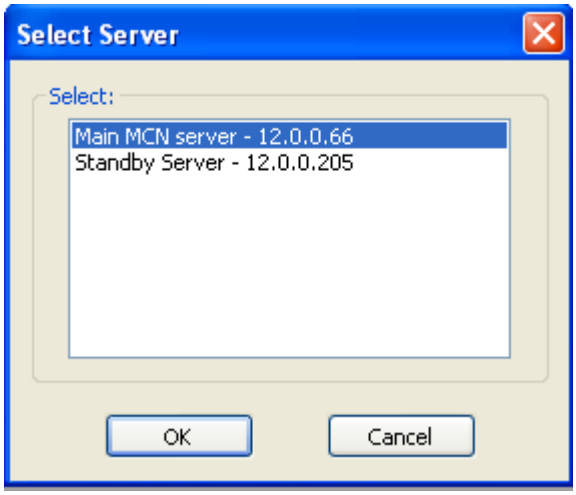


- Select the appropriate screen from the list presented and hit OK.
- The new screen will appear:

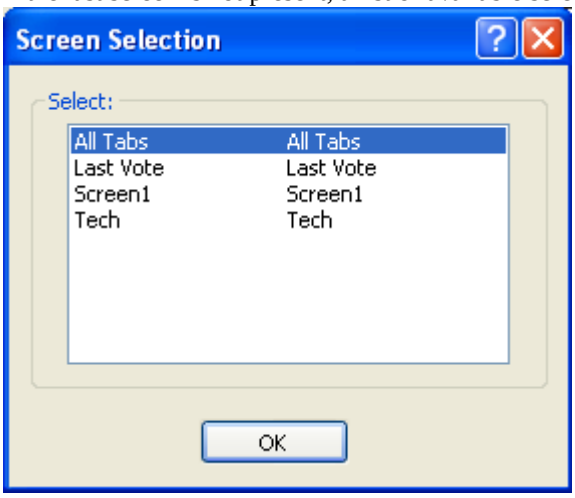


Select Server

The Select Server menu item presents a list of servers from which to select:



- Select the appropriate server from the list presented and hit OK.
- If the last screen you opened is present on the new server, it will be loaded automatically.
- If the last screen is not present, a list of available screens on the new server will be shown:



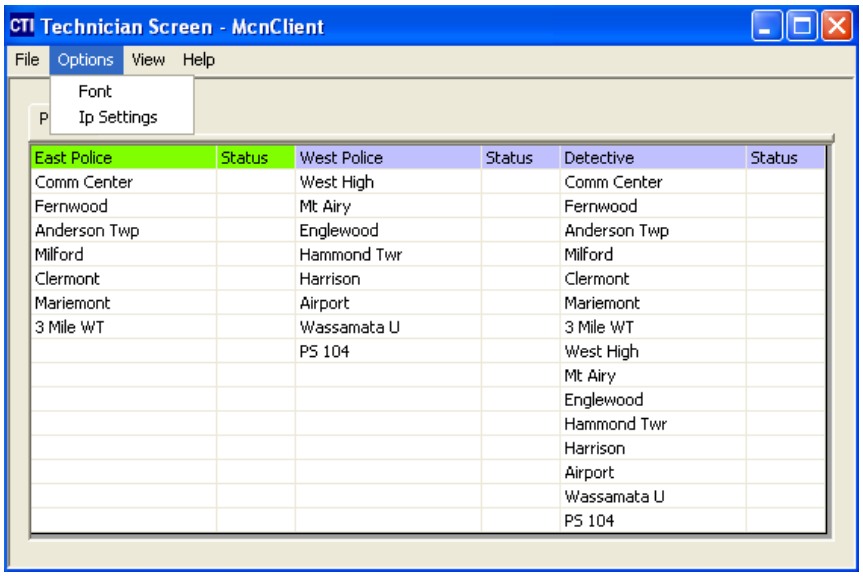
- Select the desired screen and hit OK.

Options Menu

The Options menu has the following menu items

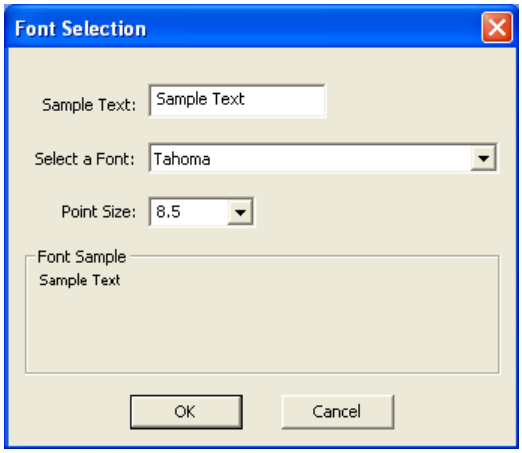
Font Allows you to adjust the font type and size for this screen

IP Settings Allows you to change the IP settings (as described earlier)



Font Window

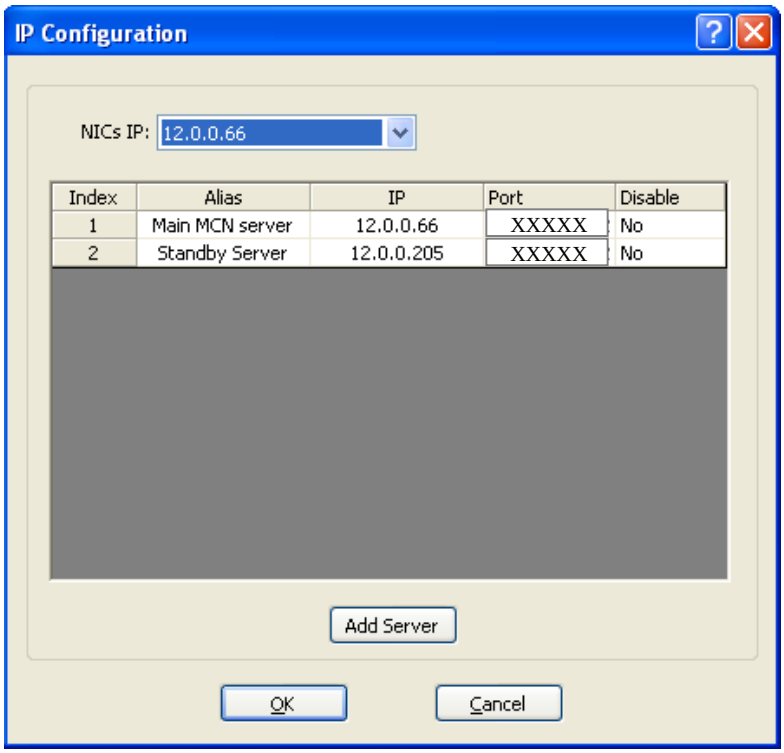
The Font Selection window is used to select a font and a font size for the Receivers and Function Blocks in the Display Window.



The row sizes will automatically stretch or shrink in response to font size changes. You may have to change the column widths manually after you make a change. See page ***149*** for directions for setting column widths.

IP Settings

This IP Configurations window is the same window that appears when the MCN Client program is run for the first time.

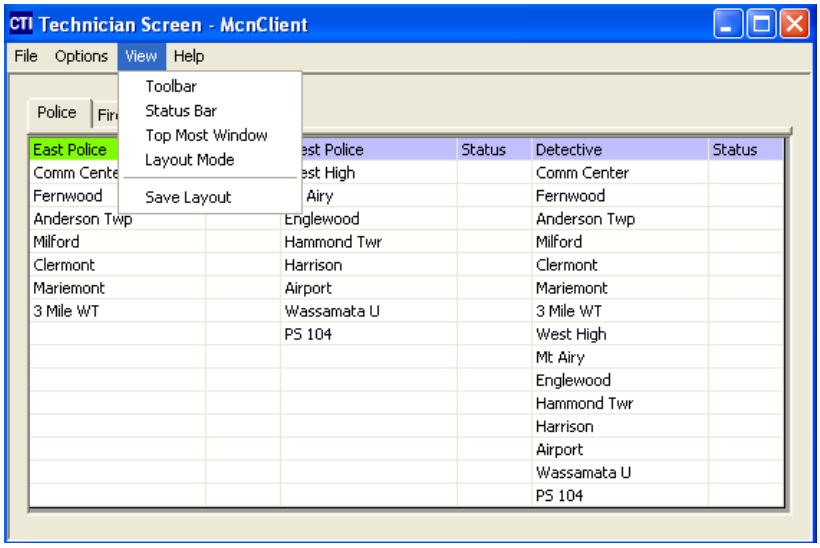


Enter the proper Port Number for the MCN Servers in your system.

If your system is set up with user account restrictions, you will not be able to save the settings from this window if you have only User Account rights.

View Menu

The View menu item has the following options:

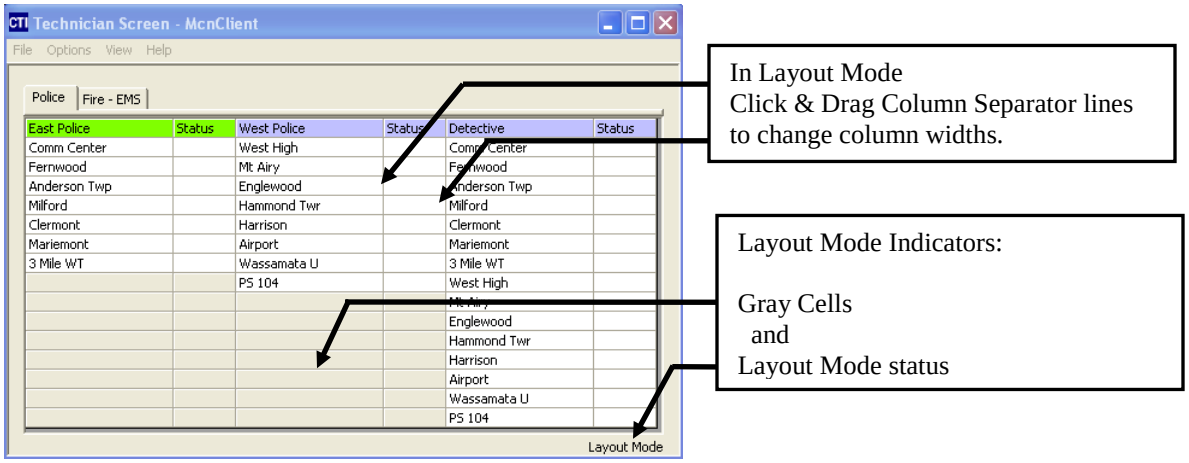


Toolbar	Turns the Toolbars on or off.
Status Bar	Turns the Status Bar (at the bottom of the screen) on or off.
Top Most Window	Allows MCN Client window to stay on the top of other programs that are running.
Layout Mode	This allows you to edit the column widths.
Save Layout	Saves the column widths and Display Window position.

Layout Mode

When this is on, you can drag the vertical column bars. The unused cells turn gray to indicate you are in Layout mode.

All the Receiver columns have the same size and all the Status columns have the same size.



When in Layout Mode, the program will not send mouse clicks to the MCN Server.
Turn off Layout Mode to enable normal program operation.

Client Normal Run-Time Operation

Status Display

When the Client is running and getting information from the Server, it will provide a Status Display for the individual receivers and I/O devices in the loaded system.

Control

The Client can also control the receivers in the comparators and also the generic Outputs if the system is configured for Control operation. On Comparators, the typical control features are:

- **Force-Vote** Left Mouse Click (momentary)
- **Disable / Enable** Right Mouse Click (latched)

Some systems may have the Control functions disabled for some clients. See your system administrator if you have questions.

See your system administrator about controls for other output devices.

Multiple Tab Systems

Some systems have multiple tabs. Use the mouse to Select the tab you desire to view. If there are many tabs, use the Left & Right arrows on the top right of the Tab Bar to scroll to the Left or Right.

Client Program Notes

Data Loading & Cache Files

The Client program gets its data from the MCN Server. The first time a Client connects to a server, it loads the system configuration files from the Server. Once it loads the data, it will save a copy of the data in a local data cache.

When the Client connects to a Server, it will check to see if its local cache is current. If so, it will use the local cache to speed up the connection. If the cache is not current, it will re-load the data from the server.

It may take a long time to load the data file the first time or after it has changed. This could tame a matter of many minutes, especially with large systems, large Display Tables and when the Client is connected to the Server via routers.

Backup MCN Servers

The Client program can access backup MCN Servers (if present). When the connection to the main server is lost, the program will try to connect to the backup server(s).

IP Multicast Required

The MCN Server sends the real-time data to the Client software over IP Multicast. The network routers and switches between the Server and Client must support IP Multicast and must pass the IP Multicast Group and Port configured in the MCN Server.

IP Multicast Error Windows

Error windows will be displayed for the following IP Multicast errors:

1. If the network is blocking the IP Multicast traffic, the Client will display an error message indicating that it is not receiving Multicast traffic.
2. If the Client sees IP Multicast traffic from a different Server on the configured IP Multicast address, it will display a "Foreign Multicast" error window. (Each MCN Server must have its own Multicast IP address.)

Windows Event Logging

In addition to the logging described in Appendix A: Error Logging Definitions, the MCN Server 8000 system logs significant events to the Windows Event Log, including:

MCN Config Server

Program start and stop

System Load

Saving a System

MCN Server 8000

Program start and stop

System Load

File Open Errors

Connection to and disconnection from IP Comparators

Connection to and disconnection from HIB-IP units

Connections & Disconnections of MCN Client PCs

Unauthorized Client log-on attempts

Mouse actions (ex: Force-Votes & Disables) for MCN Server 8000 & Clients

Log events ad defined in xxxx.RcdLog (typically Disables & Fails for receivers)

Changes made to registry (HKLM)

ClientRCD

Program start and stop

Connection to and disconnection from Server PC

Connection rejected by MCN Server

Changes in Server List

Changes made to registry (HKLM)

Advanced Configuration Topics – MCN Config Server 8000

Working with Display Tables

Display Tables map the input bit values from the devices to the text and colors to be displayed on the screen. If there is a standard Display Table for your receivers or I/O types, you probably will not need to modify the data in the Display Tables window.

The Display Tables window allows you to:

- Define new Display Tables for I/O devices and
- Modify the text and colors displayed for the default Display Tables provided with the software.

A number of Display Tables are pre-defined for comparators:

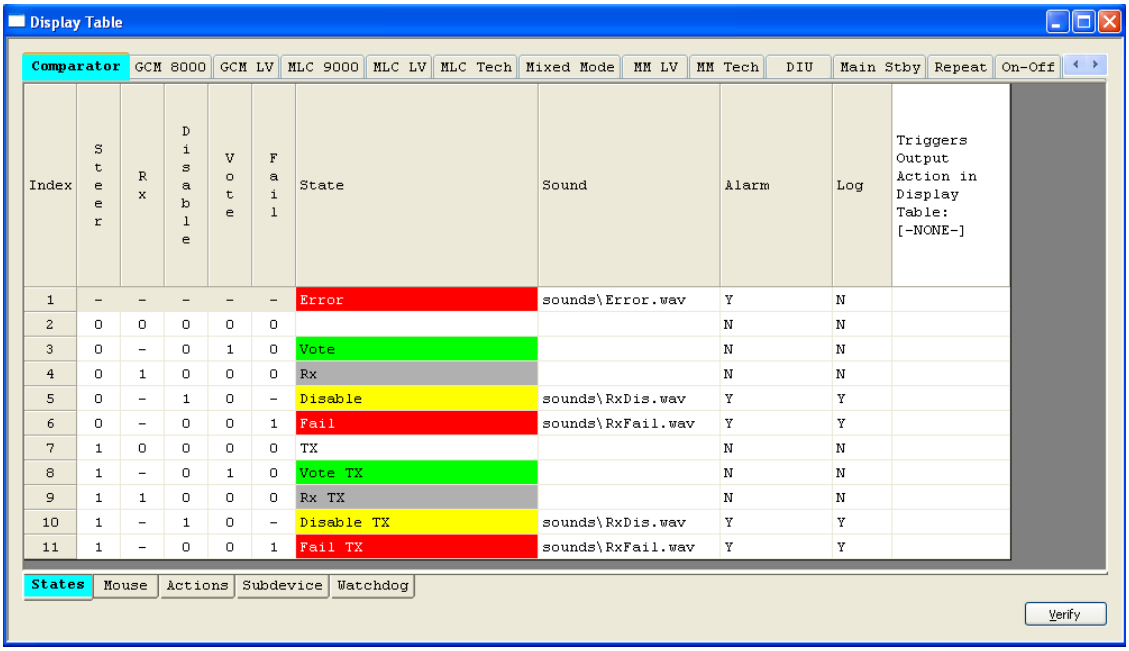
- Comparator
  for Astrotac, Digitac, Spectra-TAC, SNV-12, etc.
- GCM 8000, GCM LV
  for GCM 8000 IP comparators
- MLC 8000, MLC LV, MLC Tech
  (for MLC 8000 Analog Comparators
- Mixed Mode, MM LV, MM Tech
  for Mixed Mode GCM 8000 & MLC 8000 Analog Comparator systems
- DIU for Astrotac 3000 DIU ports

Other Display Tables are pre-defined of I/O purposes or system control:

- Main Standby
- Repeat
- Master and Sub-Comparator Display tables
- On-Off
- Generator
- Door
- Power
- Fail
- Temperature
- Binary

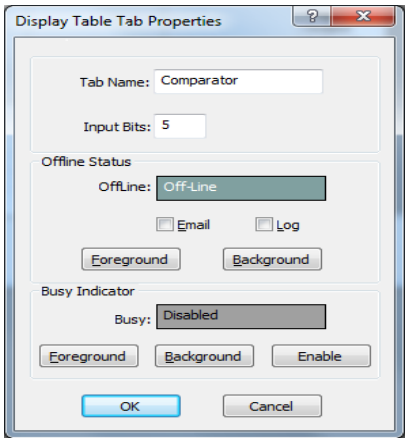
If you don't need to add or change any Display Tables, jump ahead to the Building Screens -- Display Windows section on page ***99*** to start building display screens.

To display the Display Table window, select **View / Display Tables** from the menu.



Display Table Properties Window

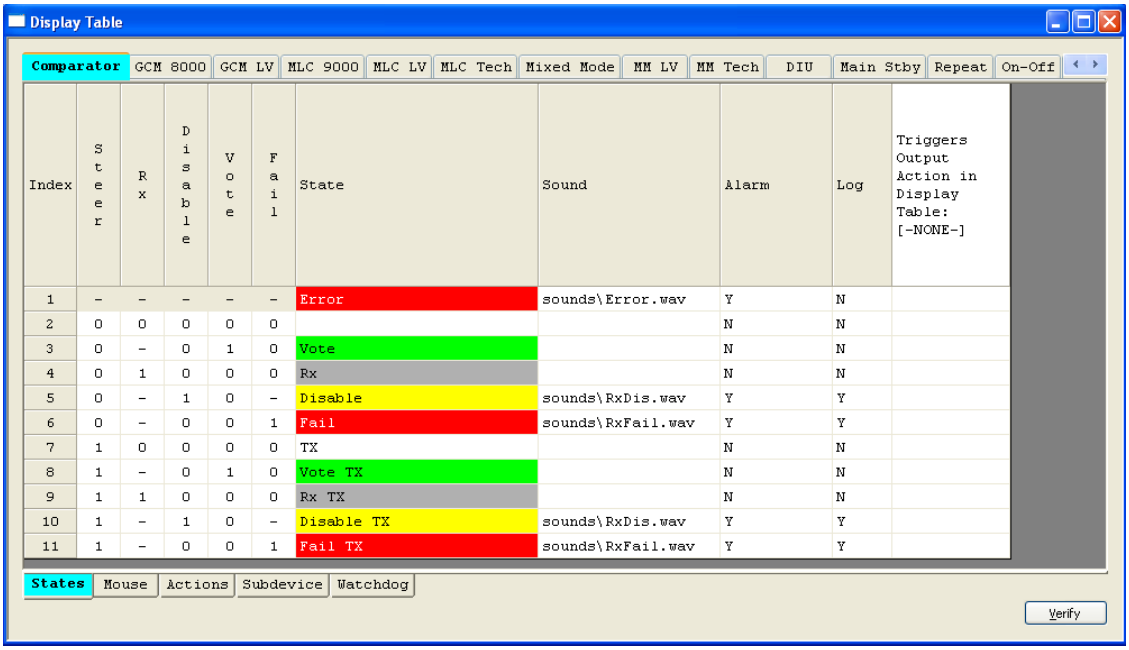
To display the overall properties for a Display Table, **Double-Click** on its **tab** at the top of the window.



From the Display Table window you can change the following items for this Display Table:

-Display Table (tab) name
-Number of input bits
-Offline Text & Colors (displayed when a module is offline)
- Logging flag for the Off-Line state.
-Busy State indicator (for legacy modules)

States Tab



Index	Steer	Rx	Disable	Vote	Fail	State	Sound	Alarm	Log	Triggers Output Action in Display Table: [-NONE-]
1	-	-	-	-	-	Error	sounds\Error.wav	Y	N	
2	0	0	0	0	0			N	N	
3	0	-	0	1	0	Vote		N	N	
4	0	1	0	0	0	Rx		N	N	
5	0	-	1	0	-	Disable	sounds\RxDis.wav	Y	Y	
6	0	-	0	0	1	Fail	sounds\RxFail.wav	Y	Y	
7	1	0	0	0	0	TX		N	N	
8	1	-	0	1	0	Vote TX		N	N	
9	1	1	0	0	0	Rx TX		N	N	
10	1	-	1	0	-	Disable TX	sounds\RxDis.wav	Y	Y	
11	1	-	0	0	1	Fail TX	sounds\RxFail.wav	Y	Y	

Each Display Table has a series of states based on the values of the input bits. In addition to the specifically defined input states, each Display Table has two special states:

- Offline. This is displayed when a module is offline. It is configured in the Display Tab Properties window.
- Default: This is the first state in the table (with all dashes).
  It is used for any of the conditions not shown in the table.

The fields in the States tab are:

State Bit Names

This field shows the functions of the input bits as received from the hardware. Bit 0 (LSB) is the right-most bit in the State Lines.

Since the comparator modules have fixed bit assignments, the Comparator Display Table has fixed bit names. Bits used by other I/O devices will be user-defined based on their function. The Bit Names in these Display Tables are user-assignable.

State Input Bits

Each Status line has a series of input bits that corresponds to its state. This is a trinary (binary with don't care) field that defines the state.

Trinary Values

0	Not active
1	Active
-	Don't Care

Don't Care bits

A state that has a dash "-" in a bit position will be active whether that bit is either active or inactive. For example, in the standard Comparator Display Table, the Vote state has a Don't Care for the Rx bit. The Vote status will be indicated whether or not the Receive bit is active.

State Priority

The states in the table have the following priority:

1.	Off-Line	If the module is off-line.
2.	Numbered States	Lowest number has the highest priority.
3.	Default State	If no other state is found to match the input bits.

If an input value is covered by two defined states, the lower numbered state will be displayed.

State Text & Color Field

This is free-format text to be displayed when this state is active.

Foreground and background colors can be defined for each state.

Sound Field

This field is the .WAV sound file to be played if the input has the Alarm bit enabled. It will be played whenever any input changes to this state.

Sounds are played only if the state is also logged. If you want a sound to play for a state entry, make sure the Log field is set to 1.

Alarm Field

This is a flag to determine whether or not to show this bit in the Alarm window (and play a sound associated with it) when it is active.

0 = Don't use Alarm Window

1 = Use Alarm Window

If the Alarm flag is set to 1, the input will appear in the Alarm Window (and an optional sound will be played) whenever an input goes into this state.

Log Field

This is a flag to determine whether or not to log this state (to screen, printer, or disk).

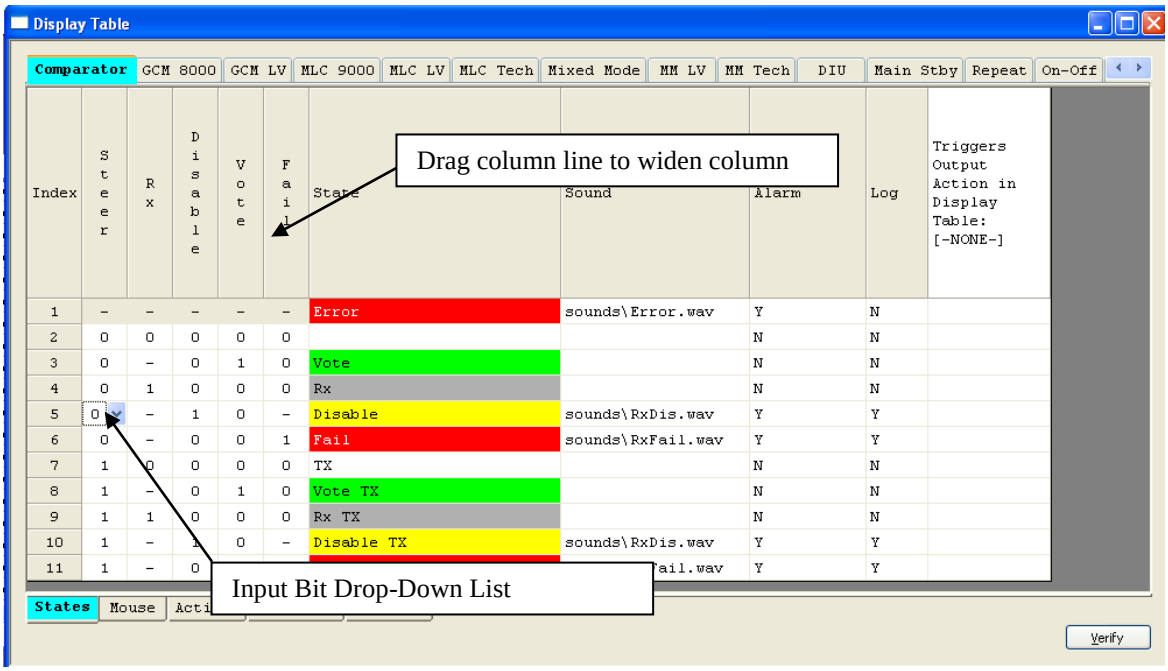
0 = Don't log

1 = Log

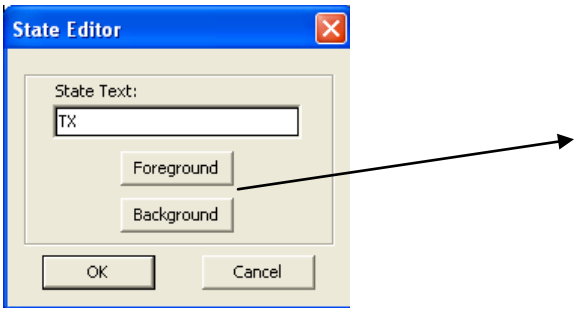
If the Log flag is set to 1, a log entry will be generated whenever an input goes into or out of this state.

Editing the fields

Input Bit Values: Click in the bit value field to edit
You can either enter a value (0,1,-) or use the drop-down list.
You may need to widen the columns to see the drop-down list properly.



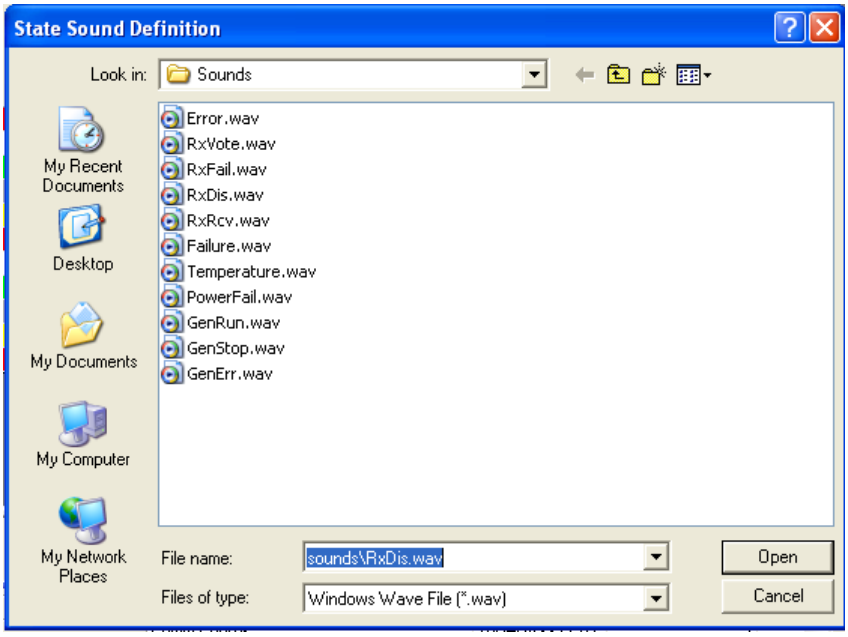
State Names Double click on the State name.
A State Editor dialog box will appear.
Enter the appropriate State Text.



State Color From the State Editor dialog box, hit the Foreground or Background button.
Select the appropriate color.

Sound

Sounds are used for Alarms only. When an Alarm goes active, the program can play a WAV file. To select a sound, double click in the Sound cell. Select the appropriate WAV file from the State Sound Definition window.

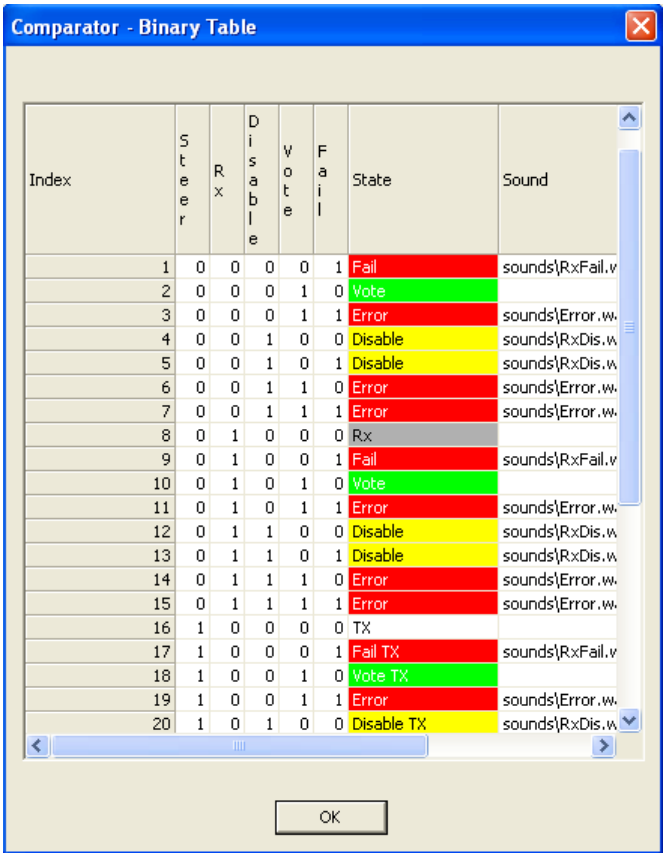


Log Flag

Click in the field.
Type in "Y" or "N" or use the Drop-Down List.

State Table Verify

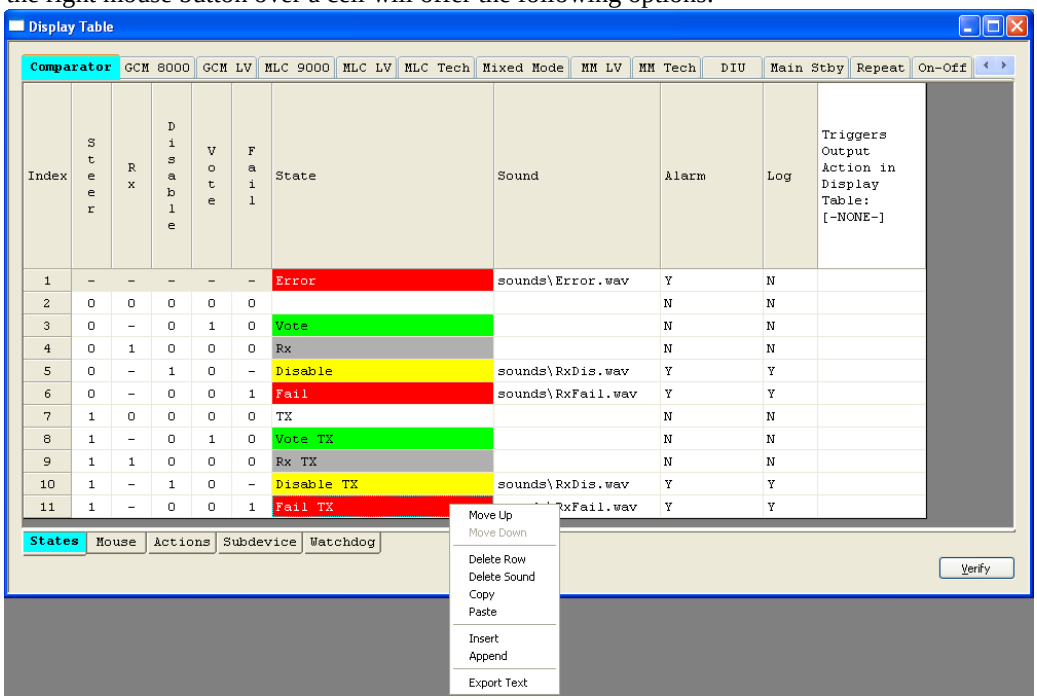
Since the entries in the Display Table are free-format (and also allow Don't Care bits), it's easy to build a Display table that doesn't work as you thought it would. You can therefore verify how the MCN software will interpret the table by clicking the Verify button on the bottom right corner of the Display Table window. This will bring up a Display Table Verification window; which will show the states that result from each possible binary input value.



Index	Steer	Rx	Disable	Vote	Fail	State	Sound
1	0	0	0	0	1	Fail	sounds\RxFail.w
2	0	0	0	1	0	Vote	
3	0	0	0	1	1	Error	sounds\Error.w
4	0	0	1	0	0	Disable	sounds\RxDis.w
5	0	0	1	0	1	Disable	sounds\RxDis.w
6	0	0	1	1	0	Error	sounds\Error.w
7	0	0	1	1	1	Error	sounds\Error.w
8	0	1	0	0	0	Rx	
9	0	1	0	0	1	Fail	sounds\RxFail.w
10	0	1	0	1	0	Vote	
11	0	1	0	1	1	Error	sounds\Error.w
12	0	1	1	0	0	Disable	sounds\RxDis.w
13	0	1	1	0	1	Disable	sounds\RxDis.w
14	0	1	1	1	0	Error	sounds\Error.w
15	0	1	1	1	1	Error	sounds\Error.w
16	1	0	0	0	0	TX	
17	1	0	0	0	1	Fail TX	sounds\RxFail.w
18	1	0	0	1	0	Vote TX	
19	1	0	0	1	1	Error	sounds\Error.w
20	1	0	1	0	0	Disable TX	sounds\RxDis.w

Display Table Right Mouse Menu

Clicking the right mouse button over a cell will offer the following options:



Move Up
Moves a row up one position

Move Down
Moves a row down one position

Delete Row
Deletes a row

Delete Sound
Deletes the sound entry for the selected row.

Copy
Copies the highlighted cell(s) to the clipboard. Does not work with entire rows.

Paste
Pastes the clipboard to the current cell. If more than one cell is on the clipboard, the additional cells will be pasted to cells to the right.

Insert
Inserts a blank row at the current location

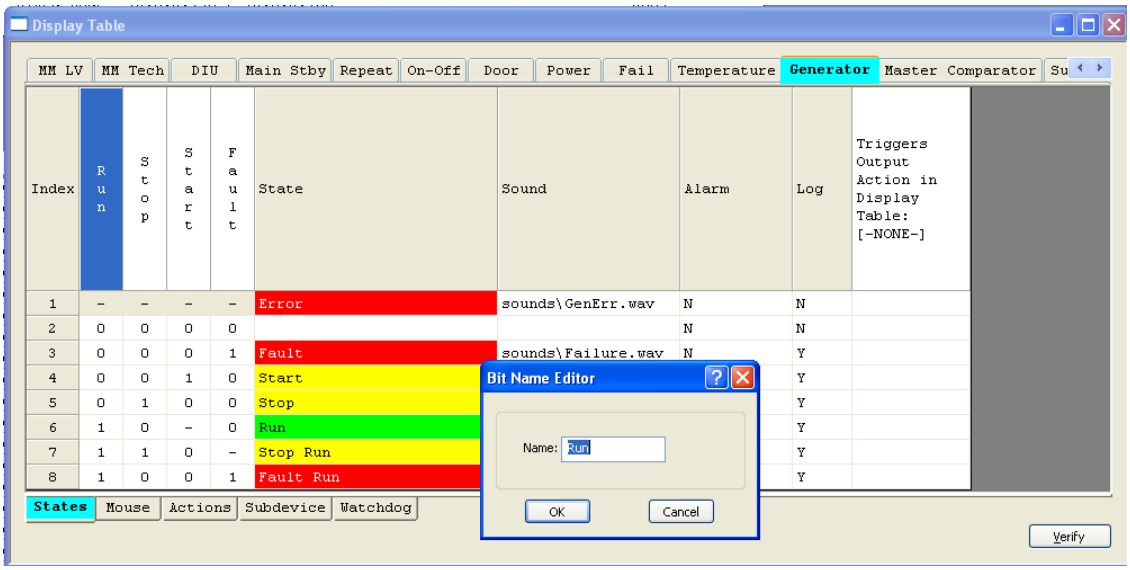
Append
Appends a blank row to the end of the Display Table

Export Text
Will export a text file copy of the contents for this window.

Editing Bit Names

To edit the Bit Names for a Display Table, **Double Click** on the Bit Name.

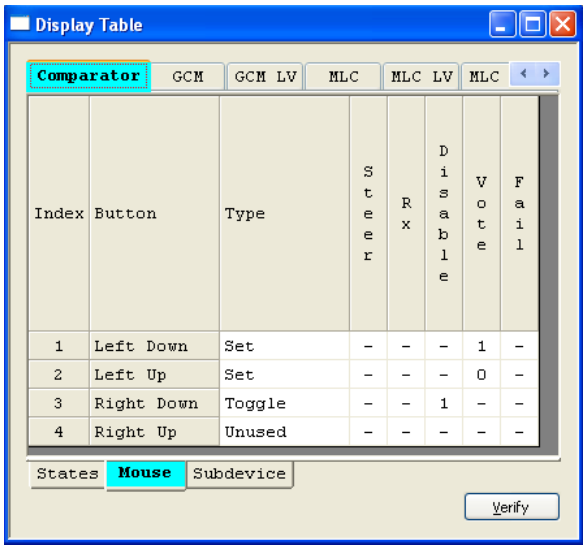
The Bit Names for the Comparator Display Table are fixed and cannot be edited.



Mouse Actions Tab

Four(4) mouse button actions are defined for each Display Table:

- Left Mouse Button Down (Press)
- Left Mouse Button Up (Release)
- Right Mouse Button Down (Press)
- Right Mouse Button Up (Release)



Each Mouse Event Line contains the following fields:

Button
Describes the mouse event

Type
This is the action that will be taken when this mouse event occurs.
Choices are:

-Unused	This Mouse Event does not generate an I/O event
-Set	This Mouse Event explicitly sets defined bits to the states shown. ("0"bits are set to 0, "1" bits are set to 1, "-" bits are left alone)
-Toggle	This Mouse Event toggles the state of all the bits marked with a "1".

Bits
The bit names are taken from the States tab. They can be either "0", "1" or "-".
See the **Type** field for description of how each of these bits is handled.

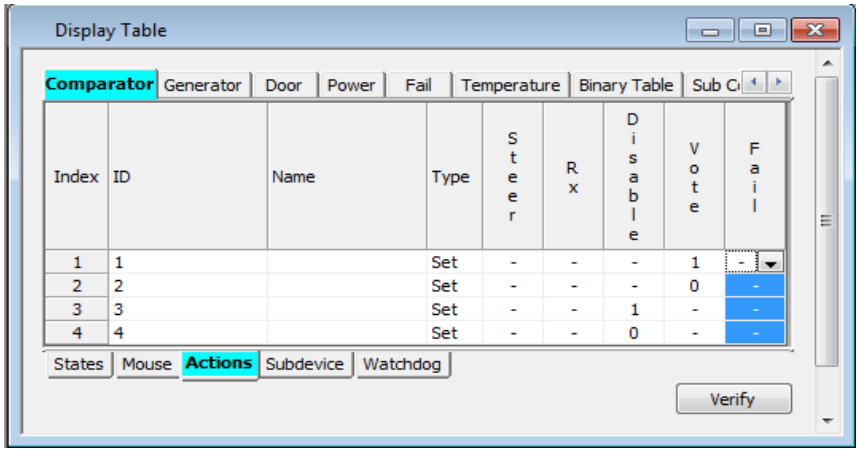
Note that the bits that appear here may not all be output (control) bits, due to the actual device being controlled. In the example above, the only valid output bits are Vote and Disable.

Editing the fields

Type	To edit, click in the field. Select the type with the Drop-Down menu.
Bits	To edit, click in the bit value field. You can either enter a value (0,1,-) or use the drop-down list. You may need to widen the columns to see the drop-down list properly.

Actions Tab – Used for Triggered Action and TPCI Licensed Options

The Actions Tab controls optional actions for the Display Table. These Actions are only available for the licensed Triggered Actions and Third Party Client Interface (TPCI) options. It is similar to the Mouse tab and provides additional control functions that can be accessed by the Triggered Actions and Third Party Client. (Although the Actions tab may be displayed , the settings are only used with the Triggered Actions and TPCI Options.)



The above Actions table provides a way to explicitly Disable (ID 2) and Enable (ID 3) a receiver (as compared to the toggle action in the Mouse table).

Actions Line contains the following fields:

ID
Numeric ID sent by the Third Party Client to generate this action. The IDs must be unique.

Name
This field is for a descriptive name that is unique to the action it identifies.

Type
Same as Type in the Mouse Tab.

Bits
Same as the Bits field in the Mouse Tab.

Editing the fields

ID
To edit, click in the field.
Enter the ID number to use.

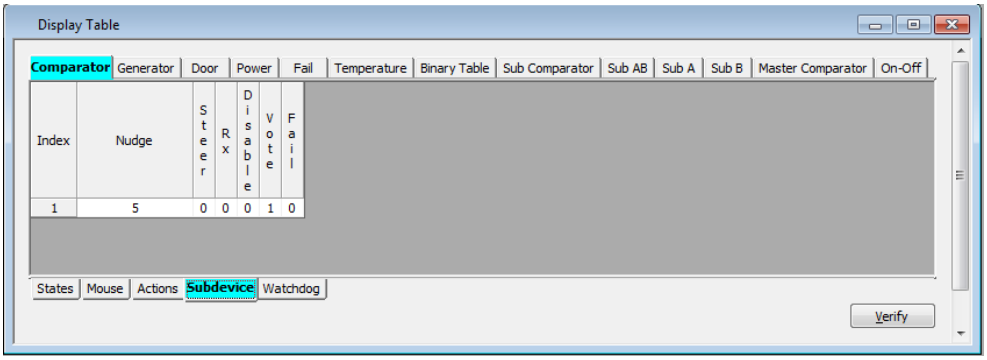
Type
To edit, click in the field.
Select the type with the Drop-Down menu.

Bits
To edit, click in the bit value field.
You can either enter a value (0,1,-) or use the drop-down list.
You may need to widen the columns to see the drop-down list properly.

SubDevice Tab

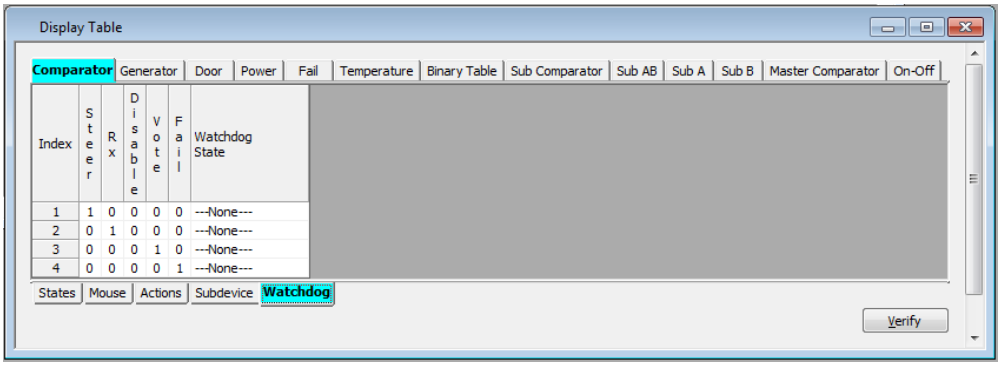
This is an advanced tab and is normally not used on standard MCN Server 8000 systems with IP comparators. It is typically used for Master and Sub comparators.

This tab will not be present on the Display Table screen unless the "Enable Sub Comparators" is enabled under the View Menu. The entry in this table tells the system which bit(s) should be passed down to subdevices and how many bits they should be shifted (Nudge). For specific details about this Tabs' functions and options see Page ***174***. For a deeper understanding about the application, configuration and implementation of Master-Sub Comparators, refer to the Configuring Master-Sub Comparator Systems section on Page ***165***.



Watchdog Tab – used with System Performance Toolkit licensed option

This tab controls parameters for the future System Performance Toolkit option. For more details, see the manuals for the System performance Toolkit software.

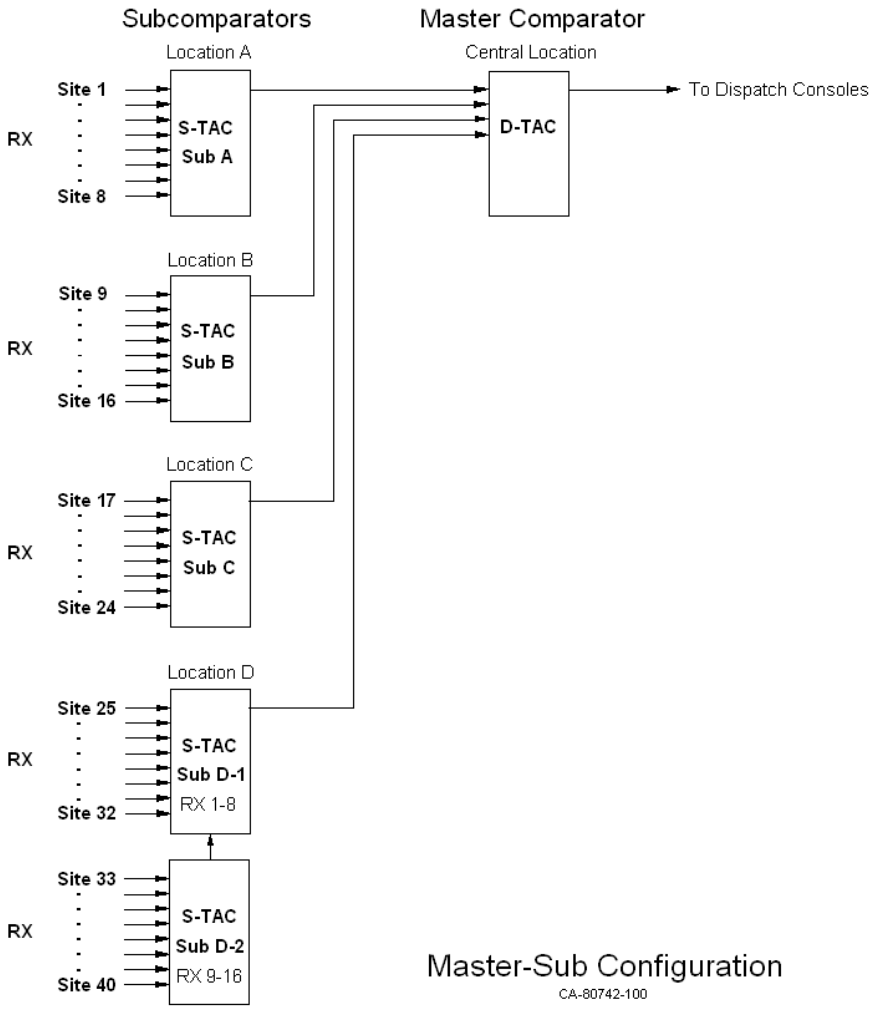


There will normally not be any lines entered in this table unless the System Performance Toolkit is used.

Configuring Master-Sub Comparator Systems

Configuration Overview

MCNRCD for Windows can handle systems in which comparators are arranged as Master Comparators and Sub Comparators. A group of comparators that are in a Master-Sub configuration can be depicted as in the following diagram.



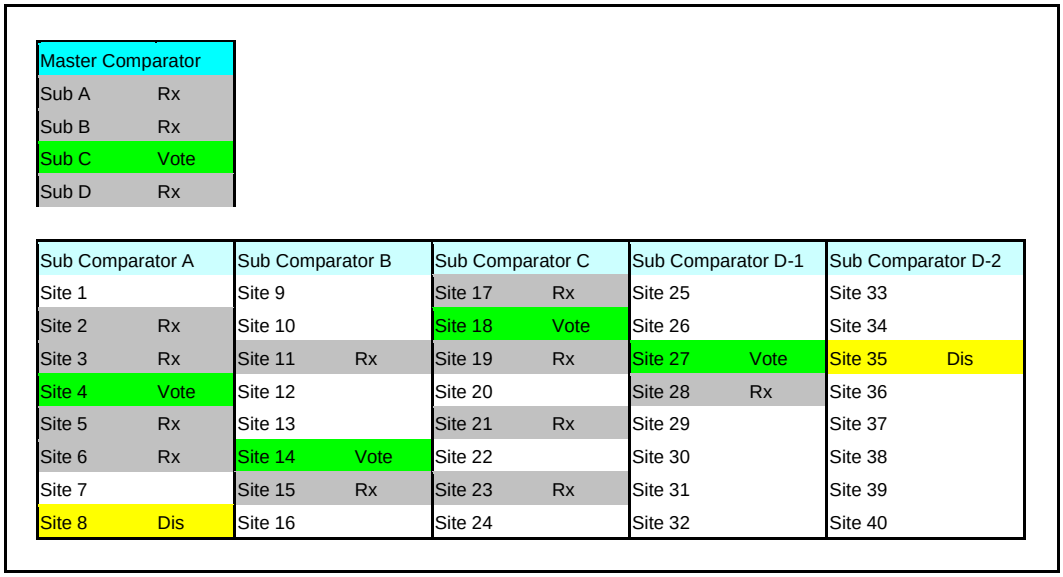
In this case, eight receivers at Location A are fed into Sub Comparator A. Likewise, eight receivers at Location B are fed into Sub Comparator B, and additional locations may have comparators with their own receivers. The selected audio from each of these locations is fed to the Master Comparator at the Central Location. Finally, the selected audio from the Master Comparator is sent to the Dispatch Consoles. Each one of the comparator chassis would have a CIB module connected to it.

Equipment-Centric View

The following diagram shows an equipment-centric view of the system described above. It has the following:

- A display for each receiver for each Sub Comparator
- A display for the Master comparator, showing each of the Sub Comparators feeding it.

It does not use the special Master-Sub Comparator features in MCNRCD (discussed below).



Master Comparator	
Sub A	Rx
Sub B	Rx
Sub C	Vote
Sub D	Rx

Sub Comparator A		Sub Comparator B		Sub Comparator C		Sub Comparator D-1		Sub Comparator D-2	
Site 1		Site 9		Site 17	Rx	Site 25		Site 33	
Site 2	Rx	Site 10		Site 18	Vote	Site 26		Site 34	
Site 3	Rx	Site 11	Rx	Site 19	Rx	Site 27	Vote	Site 35	Dis
Site 4	Vote	Site 12		Site 20		Site 28	Rx	Site 36	
Site 5	Rx	Site 13		Site 21	Rx	Site 29		Site 37	
Site 6	Rx	Site 14	Vote	Site 22		Site 30		Site 38	
Site 7		Site 15	Rx	Site 23	Rx	Site 31		Site 39	
Site 8	Dis	Site 16		Site 24		Site 32		Site 40	

The above display indicates:

- The Master Comparator is voting Sub Comparator C.
- There are other Vote indications on Sub A, Sub B, Sub C, and Sub D.

Each comparator is shown as an independent comparator (although they are actually physically connected in a Master-Sub configuration).

To determine which audio is being heard by a dispatcher, you would have to go through a two-stage process:

1. Determine that the Master Comparator is voting Sub Comparator C
2. Sub Comparator C is voting Site 18

In other words, there is no immediate direct indication of which site's audio is being heard by the dispatcher. The Votes on Sites 4, 14, and 27 from Sub Comparators A, B, & D are not the signal being used by the Master Comparator at the moment, even though they have a "Vote" indication. This can be very confusing to a dispatcher

However, the equipment-centric display could be useful for a technician who is troubleshooting the system. If, for example, a Vote is stuck on a Sub Comparator, it would be readily apparent on this screen.

Virtual Comparator View

A dispatcher is not necessarily concerned with the details of master and sub comparators. He or she wants to know which receiver is the one that is providing the audio. A System view or Virtual Comparator view is shown below.

Sub Comparator A		Sub Comparator B		Sub Comparator C		Sub Comparator D-1		Sub Comparator D-2	
Site 1		Site 9		Site 17	Rx	Site 25		Site 33	
Site 2	Rx	Site 10		Site 18	Vote	Site 26		Site 34	
Site 3	Rx	Site 11	Rx	Site 19	Rx	Site 27	Rx	Site 35	Dis
Site 4	Rx	Site 12		Site 20		Site 28	Rx	Site 36	
Site 5	Rx	Site 13		Site 21	Rx	Site 29		Site 37	
Site 6	Rx	Site 14	Rx	Site 22		Site 30		Site 38	
Site 7		Site 15	Rx	Site 23	Rx	Site 31		Site 39	
Site 8	Dis	Site 16		Site 24		Site 32		Site 40	

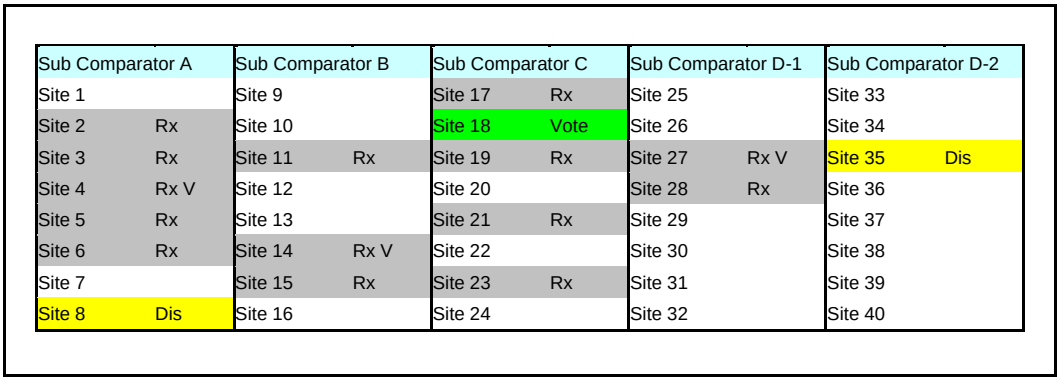
This view shows:

- A display for each receiver for each Sub Comparator
- No indication for the Master comparator
- A Virtual Comparator with 40 inputs.
- A single green "Vote" indication, showing the receiver being heard by the dispatcher.
- "Rx" indications for the receivers that are voted in the Sub Comparators but are not voted in the master.

The Virtual Comparator view uses a special Master-Sub Comparator feature of the MCNRCD software, and allows the use of a special Sub-Comparator display table. The Master-Sub feature in the MCNRCD software allows votes on sub comparators that are not being used by the Master Comparator to be modified to display “Rx” instead of “Vote”. They will be modified to display “Rx” since their sub comparators are not the voted audio at the Master Comparator. In this display, there is an immediate direct indication of which site’s audio (Site 18) is being heard by the dispatcher.

Enhanced Virtual Comparator View

An alternate Enhanced Virtual Comparator view is shown below:



Sub Comparator A		Sub Comparator B		Sub Comparator C		Sub Comparator D-1		Sub Comparator D-2	
Site 1		Site 9		Site 17	Rx	Site 25		Site 33	
Site 2	Rx	Site 10		Site 18	Vote	Site 26		Site 34	
Site 3	Rx	Site 11	Rx	Site 19	Rx	Site 27	Rx V	Site 35	Dis
Site 4	Rx V	Site 12		Site 20		Site 28	Rx	Site 36	
Site 5	Rx	Site 13		Site 21	Rx	Site 29		Site 37	
Site 6	Rx	Site 14	Rx V	Site 22		Site 30		Site 38	
Site 7		Site 15	Rx	Site 23	Rx	Site 31		Site 39	
Site 8	Dis	Site 16		Site 24		Site 32		Site 40	

This view:

- Is similar to the Virtual Comparator View
- Shows only one green "Vote" indication (the receiver whose audio is being used)
- Shows an "Rx V" indication for the sites that are voted in the Sub Comparators but are not voted in the master. The "Rx V" indication is shown in gray, so as not to be confused with the green "Vote" indication.

This provides a bit more information than the standard Virtual Comparator view. It also provides feedback to the user when he tries to Force-Vote a receiver. He will get an indication that the CIB received his command (by the "Rx V" status) even if the master comparator does not vote the receiver's Sub Comparator.

The Virtual Comparator and Enhanced Virtual Comparator views can be implemented with standard Display Tables that are shipped with the Master-Sub Comparator option. You may modify those display tables or create your own display tables to suit your system's needs.

Implementing the Virtual Comparators

To implement either of the above "Virtual Comparator" displays, the following steps should be taken:

1. **Enable Master-Sub features** of the MCNRCD for Windows software.

Setup the Network Interface, Channels, Hardware, and Receivers windows as instructed earlier in this manual

Assign Display Tables for the Master and Sub Comparator receivers and **Define the SubDevices** for each channel of a Master Comparator.

Design the Display Window for the Virtual Comparator.

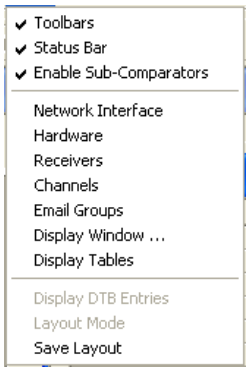
Optionally, if you want to customize the Master or Sub-Comparator display tables:

Customizing Display Tables for Master and Sub Comparators.

Each of these steps will be explained in detail in the following sections.

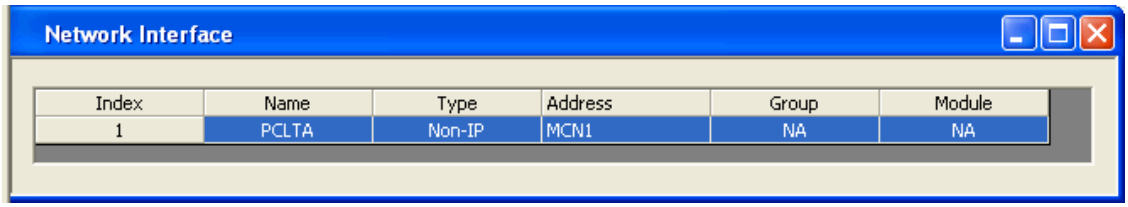
Enable Master-Sub features

From the **View** menu, click on ***Enable Sub-Comparators*** to display a "check mark" next to this menu item as shown below. This provides access to Master-Sub features of the MCNRCD for Windows software.

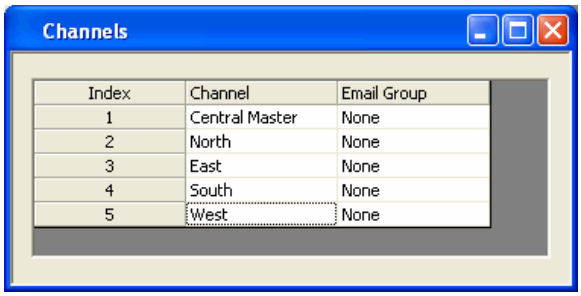


Setup Network Interface, Channels, Hardware and Receiver windows

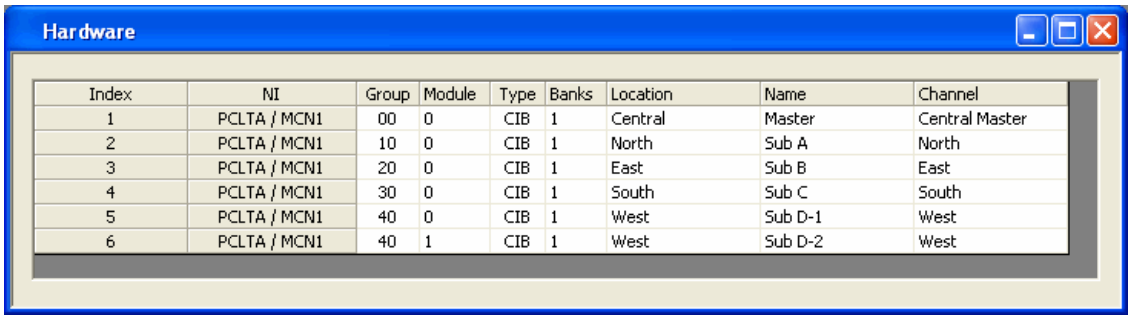
The Network Interface, Channels and Hardware windows for this example system should look like the following. The generation of these tables has been explained in previous sections of this manual, and will not be discussed in detail here.



Index	Name	Type	Address	Group	Module
1	PCLTA	Non-IP	MCN1	NA	NA



Index	Channel	Email Group
1	Central Master	None
2	North	None
3	East	None
4	South	None
5	West	None



Index	NI	Group	Module	Type	Banks	Location	Name	Channel
1	PCLTA / MCN1	00	0	CIB	1	Central	Master	Central Master
2	PCLTA / MCN1	10	0	CIB	1	North	Sub A	North
3	PCLTA / MCN1	20	0	CIB	1	East	Sub B	East
4	PCLTA / MCN1	30	0	CIB	1	South	Sub C	South
5	PCLTA / MCN1	40	0	CIB	1	West	Sub D-1	West
6	PCLTA / MCN1	40	1	CIB	1	West	Sub D-2	West

The Receivers window will be discussed in the next section.

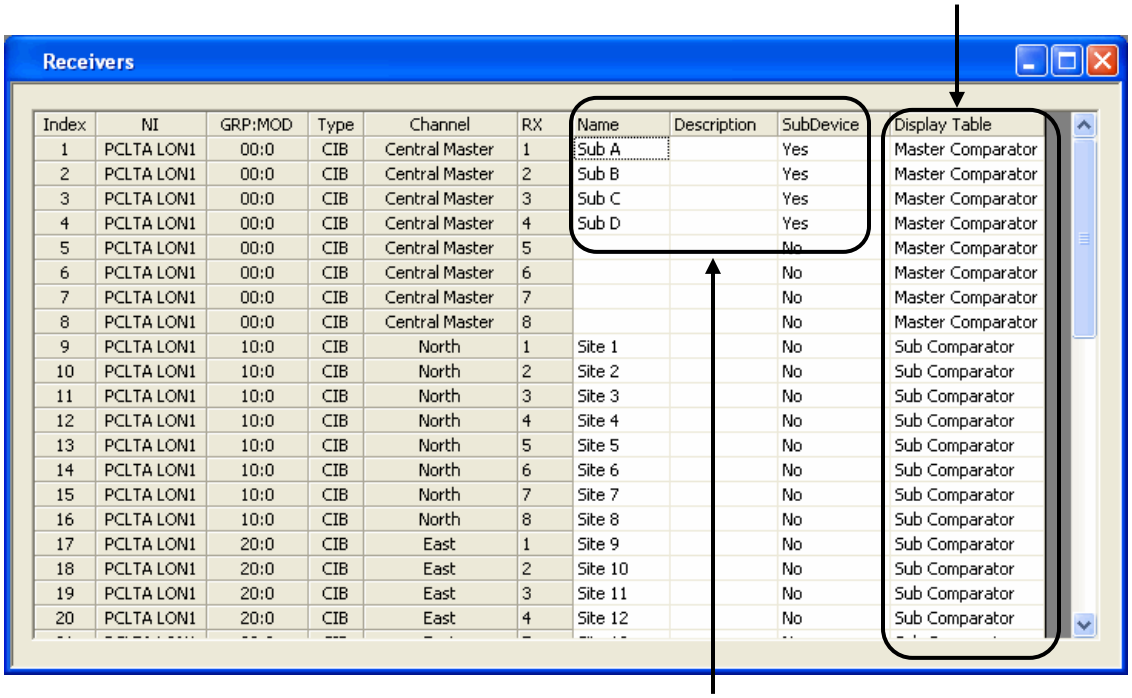
Assign Display Tables and Define the SubDevices

Assign Display Tables

In the “Receivers” window, double-click in the Display Table column and select the proper Display in the cell for each receiver as illustrated by the following Table Entry.

Receivers	**Display Table**
Master Comparator	"Master Comparator"
Sub Comparator	"Sub Comparator" (for Virtual Comparator) "Sub Comparator Enhanced" (for Enhanced Virtual Comparator)

Assign Display Tables for Master & Subs


Receivers
Index NI GRP:MOD Type Channel RX Name Description SubDevice Display Table
1 PCLTA LON1 00:0 CIB Central Master 1 Sub A Yes Master Comparator
2 PCLTA LON1 00:0 CIB Central Master 2 Sub B Yes Master Comparator
3 PCLTA LON1 00:0 CIB Central Master 3 Sub C Yes Master Comparator
4 PCLTA LON1 00:0 CIB Central Master 4 Sub D Yes Master Comparator
5 PCLTA LON1 00:0 CIB Central Master 5 No Master Comparator
6 PCLTA LON1 00:0 CIB Central Master 6 No Master Comparator
7 PCLTA LON1 00:0 CIB Central Master 7 No Master Comparator
8 PCLTA LON1 00:0 CIB Central Master 8 No Master Comparator
9 PCLTA LON1 10:0 CIB North 1 Site 1 No Sub Comparator
10 PCLTA LON1 10:0 CIB North 2 Site 2 No Sub Comparator
11 PCLTA LON1 10:0 CIB North 3 Site 3 No Sub Comparator
12 PCLTA LON1 10:0 CIB North 4 Site 4 No Sub Comparator
13 PCLTA LON1 10:0 CIB North 5 Site 5 No Sub Comparator
14 PCLTA LON1 10:0 CIB North 6 Site 6 No Sub Comparator
15 PCLTA LON1 10:0 CIB North 7 Site 7 No Sub Comparator
16 PCLTA LON1 10:0 CIB North 8 Site 8 No Sub Comparator
17 PCLTA LON1 20:0 CIB East 1 Site 9 No Sub Comparator
18 PCLTA LON1 20:0 CIB East 2 Site 10 No Sub Comparator
19 PCLTA LON1 20:0 CIB East 3 Site 11 No Sub Comparator
20 PCLTA LON1 20:0 CIB East 4 Site 12 No Sub Comparator

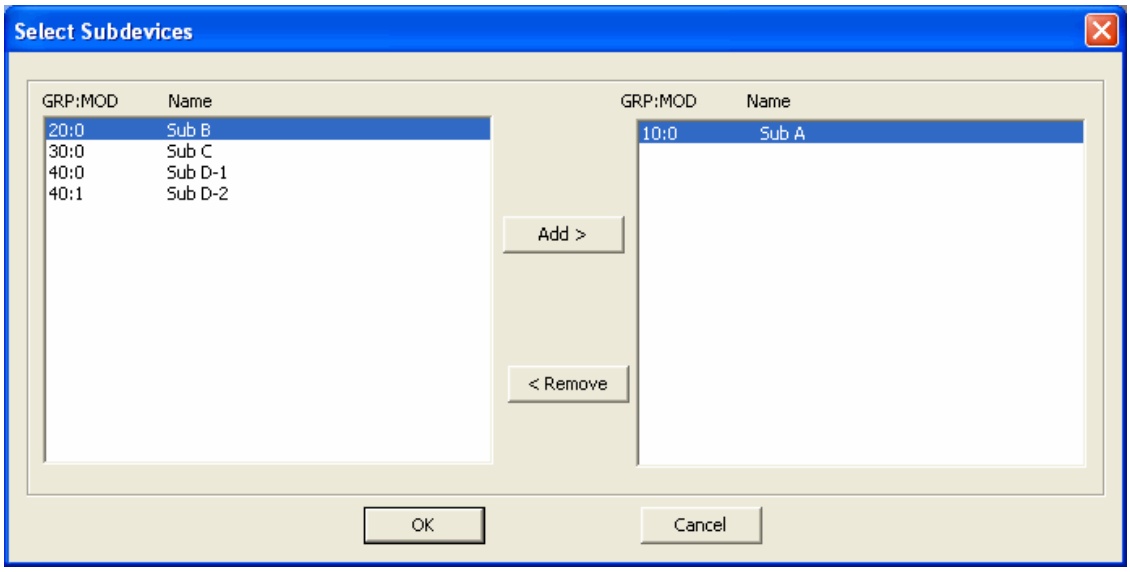
3 B: Define SubDevices for each receiver in Master comparator

Assign Sub Devices for each receiver in the Master Comparator

In the “Receivers” window, a “SubDevice” column will be displayed as shown below (only with Master-Sub features enabled as indicated above).

1. For each receiver of a Master Comparator, double-click its cell in the “SubDevice” column to display the following “Select SubDevices” window.
2. From the list of available SubDevices on the left side, “Add” the appropriate receivers to the right side of this window.

For the first Master Comparator receiver that is fed from Sub Comparator A, the "Select SubDevices" window should look like the following.

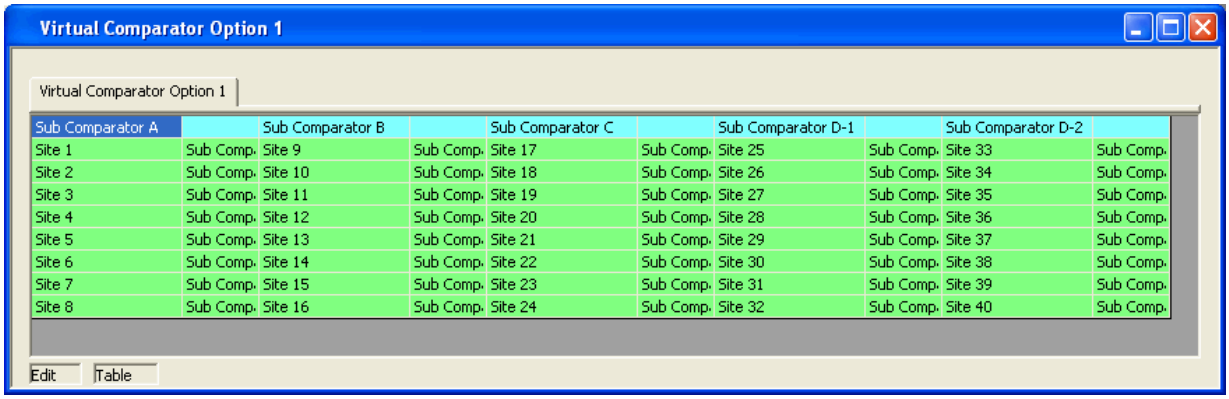


Click the **OK** button to close this window.

Notice that the cell in the "SubDevice" column of the "Receivers" window for this receiver is now set to "Yes".

Design the Display Window for the Virtual Comparator

As shown in the following Display Window, all 40 site receivers of the Sub Comparators are included in the display. Note that the Master Comparator is not shown in this Virtual Comparator view.


Virtual Comparator Option 1
Virtual Comparator Option 1
Sub Comparator A
Sub Comparator B
Sub Comparator C
Sub Comparator D-1
Sub Comparator D-2
Site 1 Sub Comp. Site 9 Sub Comp. Site 17 Sub Comp. Site 25 Sub Comp. Site 33 Sub Comp.
Site 2 Sub Comp. Site 10 Sub Comp. Site 18 Sub Comp. Site 26 Sub Comp. Site 34 Sub Comp.
Site 3 Sub Comp. Site 11 Sub Comp. Site 19 Sub Comp. Site 27 Sub Comp. Site 35 Sub Comp.
Site 4 Sub Comp. Site 12 Sub Comp. Site 20 Sub Comp. Site 28 Sub Comp. Site 36 Sub Comp.
Site 5 Sub Comp. Site 13 Sub Comp. Site 21 Sub Comp. Site 29 Sub Comp. Site 37 Sub Comp.
Site 6 Sub Comp. Site 14 Sub Comp. Site 22 Sub Comp. Site 30 Sub Comp. Site 38 Sub Comp.
Site 7 Sub Comp. Site 15 Sub Comp. Site 23 Sub Comp. Site 31 Sub Comp. Site 39 Sub Comp.
Site 8 Sub Comp. Site 16 Sub Comp. Site 24 Sub Comp. Site 32 Sub Comp. Site 40 Sub Comp.
Edit
Table

Customizing Display Tables

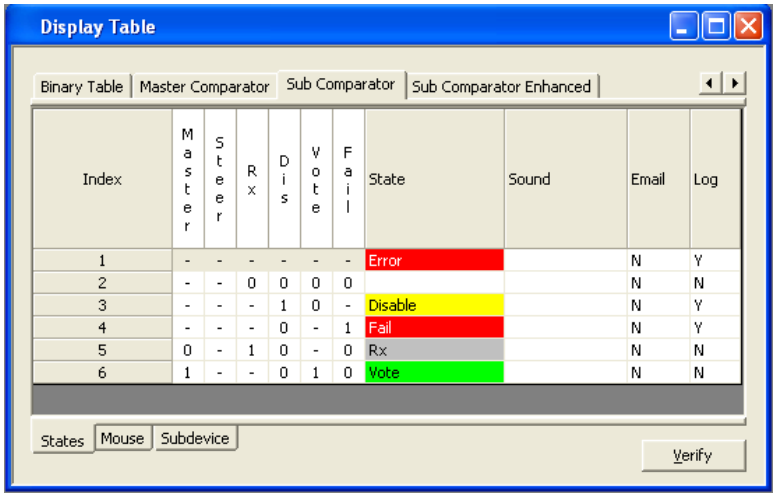
In the “Display Table” window, several types of devices have been predefined, including Comparator, Generator, Door, and others. Each device type has its own tab across the top of this window. The Master-Sub Comparator Option adds the following Display Tables:

- Master Comparator
- Sub Comparator
- Sub Comparator Enhanced

If these display tables suit your application, you can skip this section. If you need to modify them, read on.

Sub Comparator Display Table

The Sub Comparator display table **States** tab is shown below:



Index	Master	Steer	Rx	Dis	Vote	Fail	State	Sound	Email	Log
1	-	-	-	-	-	-	Error		N	Y
2	-	-	0	0	0	0			N	N
3	-	-	-	1	0	-	Disable		N	Y
4	-	-	-	0	-	1	Fail		N	Y
5	0	-	1	0	-	0	Rx		N	N
6	1	-	-	0	1	0	Vote		N	N

This Sub Comparator **States** table has several basic differences from the basic Comparator display table:

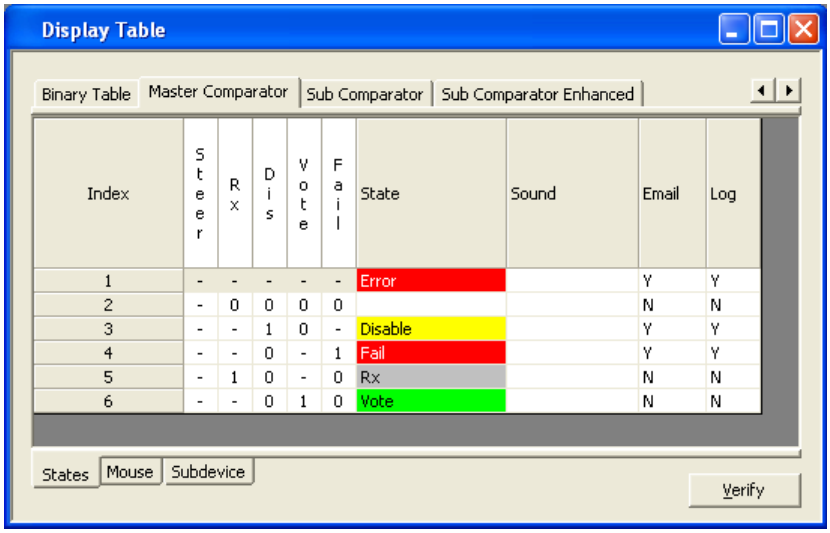
- The Steer bit is a Don't Care (we're not using Transmitter Steering in this system)
- An additional Master (Master Vote) bit has been added (leftmost bit).
- The Vote state requires the Master bit (Master Vote) bit to be set (State 6)
- If the Rx bit is set and the Master (Master Vote) bit is not set, the display will show "Rx", even if the Vote bit (Sub Comparator Vote) is set (State 5)

The Master (Master Vote) bit is inherited from the Master comparator. It is only set when the Sub Comparator is voted in the Master Comparator.

Master Comparator Display Table

States Tab

The Master Comparator display table **States** tab is shown below:

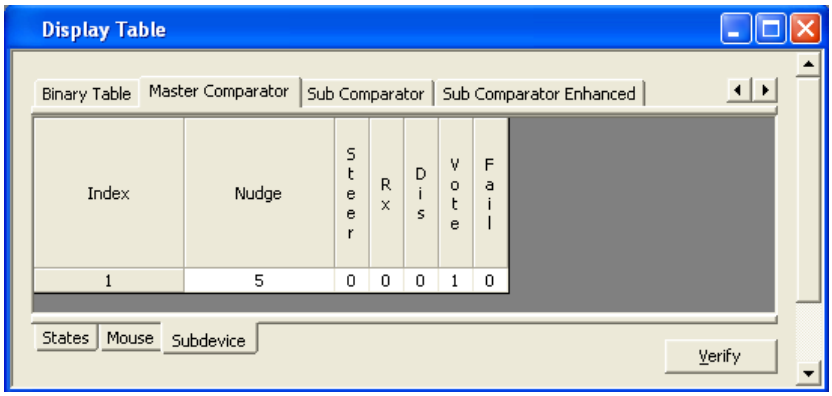


This Master Comparator **States** table has a basic difference from the basic Comparator display table:

- The Steer bit is a Don't Care (we're not using Transmitter Steering in this system)

SubDevice Tab

The **SubDevice** tab has been added in the Master-Sub Comparator option. The Master Comparator display table **SubDevice** tab is shown below:



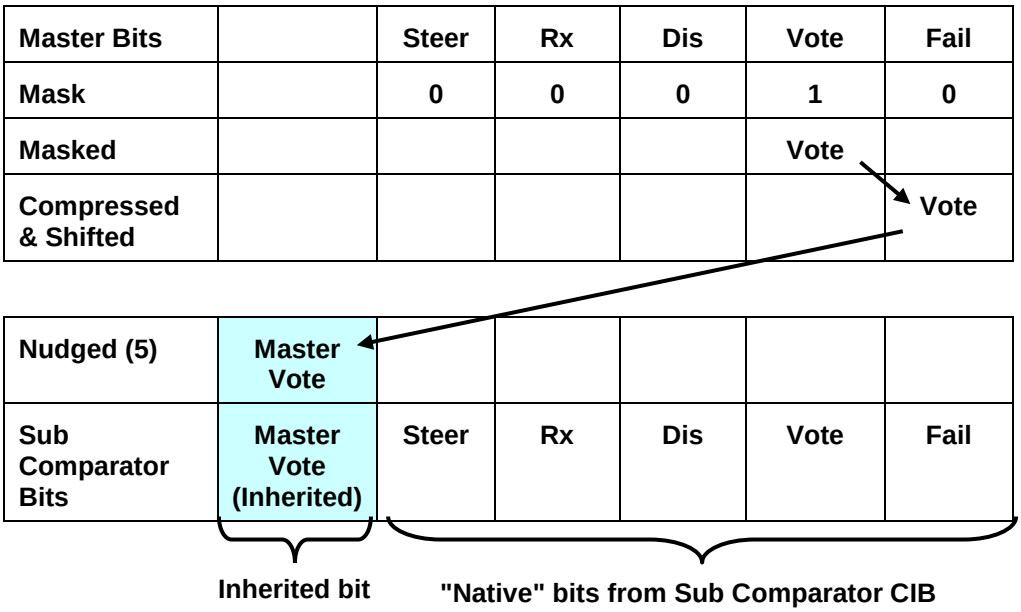
The **SubDevice** tab for the Master Comparator has the following items that are used to pass the Master Vote down to the Sub Comparator:

- Bit Mask for the Vote bit is a 1. This is the bit that will be passed on to the Sub Comparator devices.
- The Nudge field is set to 5. This tells the program how far to move the inherited bit(s) in the SubDevice. This number will depend on the SubDevice.

Bit Mask and Nudge Fields

The Bit Mask fields indicate which bit(s) is (are) used to pass to the SubDevice.

In general, the "Nudge" field should be the number of native bits in the destination SubDevice Table. (If there are Multi-dependencies – multiple Master Comparators for each Sub Comparator – you will need to specify special nudge values.)



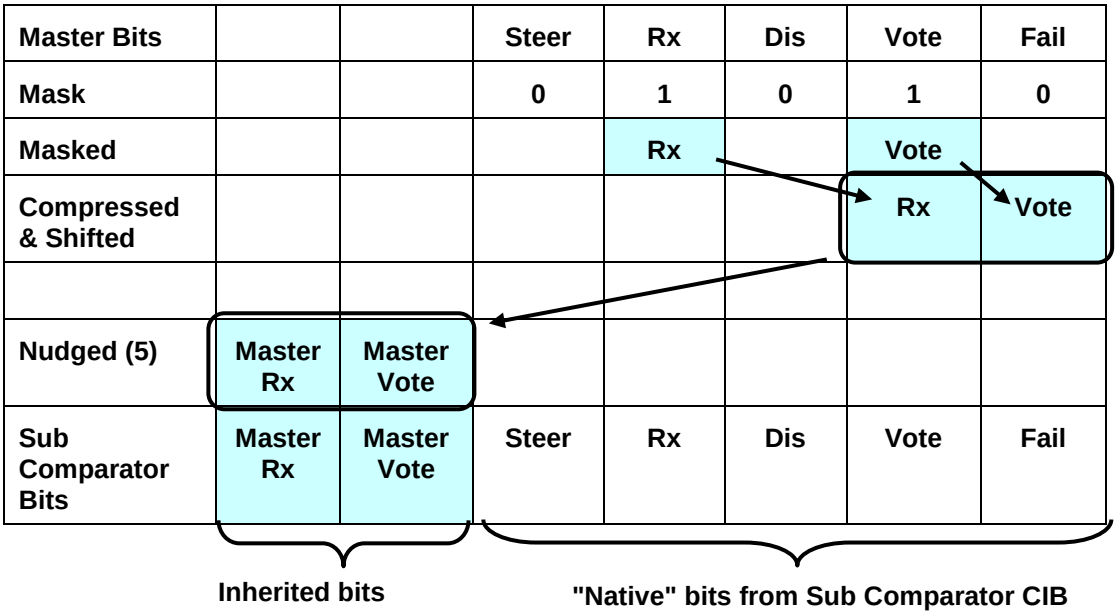
The best way to understand how to set the Bit Mask and Nudge fields is to consider how the MCNRCD program processes the bits from the Master comparator as shown above:

1. The program masks out all bits that have a "0" in the mask field.
   It passes only those bits that have a "1" in the Bit Mask field (Vote in this case)
2. All the bits with a "1" in the bit mask field are compressed and shifted to the right to fill the Least Significant Bits (right hand bits). In the above example, there is no compression going on – only shifting. The compression comes in when there are multiple non-contiguous mask bits set to "1". In that case, the program compresses the bit field by deleting all the unused bits. This is shown in the ***Multi-Bit Mask*** section on the next page.
3. The Compressed & Shifted Bits will be nudged to the left by the number specified in the "Nudge" field (5 in this case).
4. The Nudged bit will be passed to all the receivers in the Sub Comparators.
5. The resultant bits (the inherited bit plus the "native" Sub Comparator bits) will be used in the Sub Comparator Display Table to determine the status to display.

Multi-Bit Mask

There may be times in which you need multiple bits from a master device to be passed to a sub device. The following table illustrates how to do this.

If, for example, you wanted to pass the "Rx" and the "Vote" bits from the Master comparator to the Sub Comparator, you would set the mask as shown:



For Multi-Bit Master-Sub Comparator, the MCNRCD program processes the bits from the Master comparator as shown above:

1. Both the "Rx" and "Vote bits have a "1" bit set.
2. The "Rx" & "Vote" bits are compressed (unused bits are deleted) and shifted to the right to fill the Least Significant Bits (right hand bits)
3. The Compressed & Shifted Bits will be nudged to the left by the number specified in the "Nudge" field. (5 in this case)
4. The Nudged bits are passed to all the receivers in the Sub Comparators.

(Note that this is just an example of what could be done with multiple bits to show how multiple bits are handled.)

Multi-Level Inheritance – Sub-Sub Comparators

The Master – Sub Comparator feature allows you to pass bits down from a master device to a sub device as shown above. You can create multi-level systems as shown below:

Master Comparator

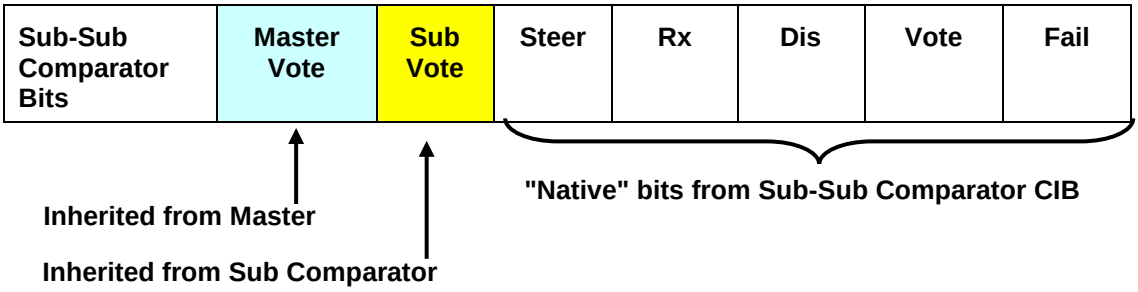
Sub Comparator

Sub-Sub Comparator

You can only pass down native bits, not inherited bits. In the example above:

- The Sub Comparator could pass its own Vote bit down to the Sub-Sub Comparator.
- It could not pass down the Master Vote bit that it inherited from the Master Comparator.

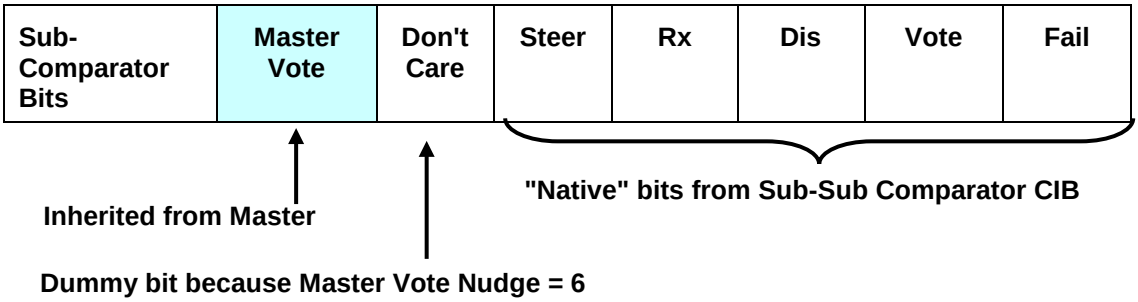
You might need a Master Vote and Sub Vote bit in the Sub-Sub Comparator as shown below:



To accomplish this, set up the following parameters:

- Master Vote Bit Nudge = 6
- Master Comparator Sub Devices: Sub Comparator & Sub-Sub Comparator
  (This passes the Master Vote bit directly down to both sub-levels)
- Sub Comparator Vote Bit Nudge = 5
- Sub Comparator Sub Device: Sub-Sub Comparator
  (This passes the Sub Vote bit down.)

Since the Master Vote bit is nudged 6 bits, it will be nudged the same amount in each of its SubDevices. Thus, the bits for the Sub Comparator Display Table for this example should be set up as follows:



When you fill out the States in this table, just make the Don't Care bit a "-" in all states.

*In this example, we were able to pass the Master Vote bit down two levels, but it was not passed through the Sub Comparator. It was passed **directly** from the Master comparator to the Sub Sub Comparator.*

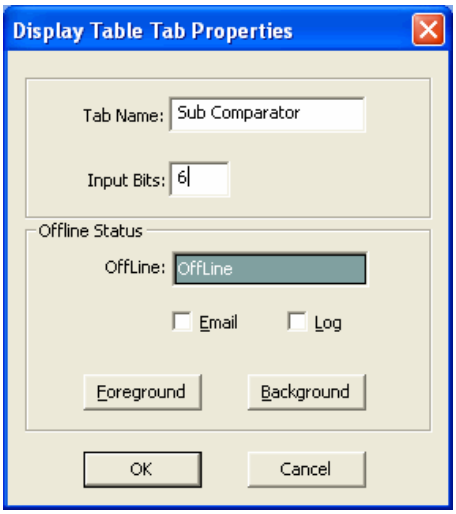
Creating New Display Tables for Master and Sub Comparators

This section shows how to add new display tables for Master or Sub Comparators. It assumes that you are familiar with the Master and Sub device bit interaction as described in the previous section.

Sub Comparator Display Table

To add a tab for a new device to properly display the four Sub Comparators in our "Virtual Comparator" example system from Page ***167***,

- Right-click on one of the existing tabs at the top of the Display Table window
- Click on ***Append New Table***. The following window will be displayed.



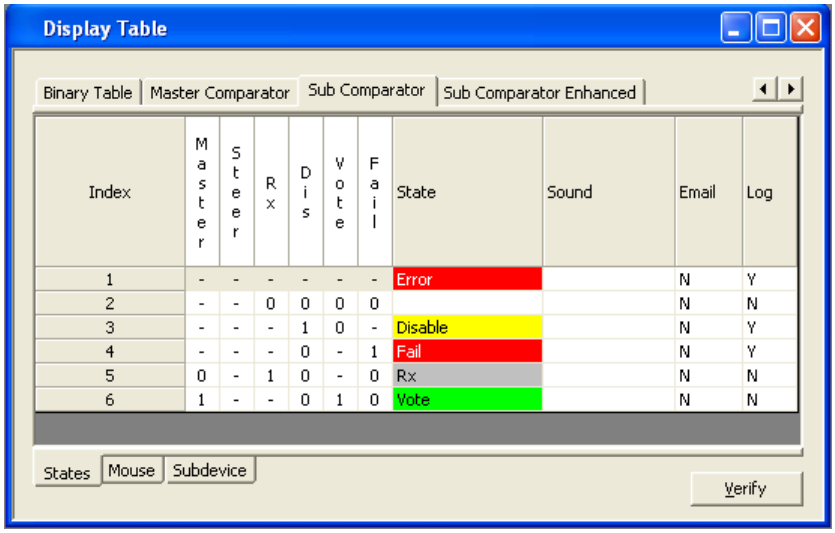
- Type in a new **Tab Name** such as "Sub Comparator ".
- Select the number of status **Input Bits** that this new device will possess.

  In addition to the 5 Input Bits of the predefined Comparator device, we will use an additional status bit to hold the Vote bit that will be inherited from the Master Comparator. So in this case, the number of **Input Bits** should be set to 6.
- Click on **OK** to close this window. A new blank display table will be entered with 6 bits.

States Tab

- Right-click anywhere on the States Table for this new "Sub Comparator" device, then click on ***Append*** to add lines for additional states.
- Modify each state line in the States Table to satisfy the display requirements for this system's "Virtual Comparator. As shown in the following, a bright Green "Vote" will be displayed only when the Sub Comparator has voted (the Vote bit is set) and the Master Comparator has voted (the Master bit is set).

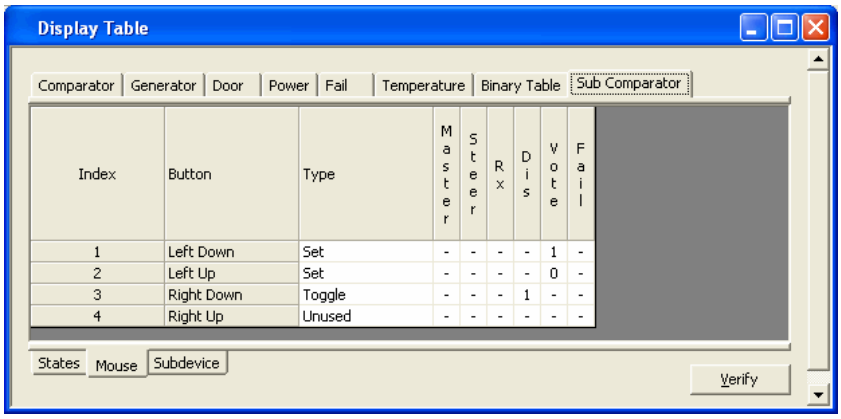
For our example of four Sub Comparators feeding into a Master Comparator, the **States** tab for a new "Sub Comparator" device may look like the following.



Index	Master	Steer	Rx	Dis	Vote	Fail	State	Sound	Email	Log
1	-	-	-	-	-	-	Error		N	Y
2	-	-	0	0	0	0			N	N
3	-	-	-	1	0	-	Disable		N	Y
4	-	-	-	0	-	1	Fail		N	Y
5	0	-	1	0	-	0	Rx		N	N
6	1	-	-	0	1	0	Vote		N	N

Mouse Tab

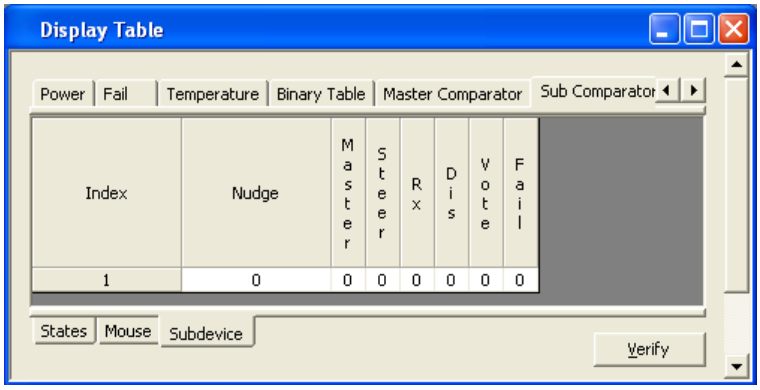
Next, the **Mouse** tab for this "Sub Comparator" display table should be modified to appear as follows.



Index	Button	Type	Master	Steer	Rx	Dis	Vote	Fail
1	Left Down	Set	-	-	-	-	1	-
2	Left Up	Set	-	-	-	-	0	-
3	Right Down	Toggle	-	-	-	1	-	-
4	Right Up	Unused	-	-	-	-	-	-

SubDevice Tab

The Sub Comparator display table should have all bits set to "0" since we are not passing bits down from the Sub Comparator to a lower level device.

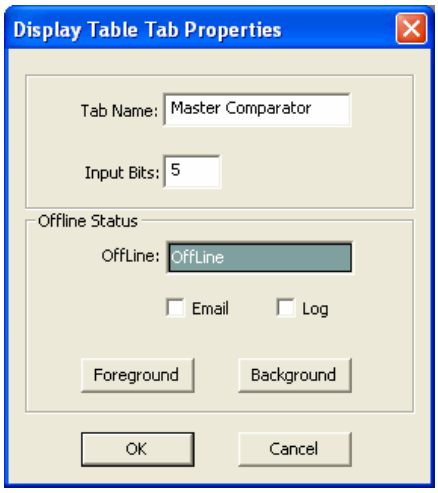


Index	Nudge	Master	Steer	Rx	Dis	Vote	Fail
1	0	0	0	0	0	0	0

Master Comparator Display Table

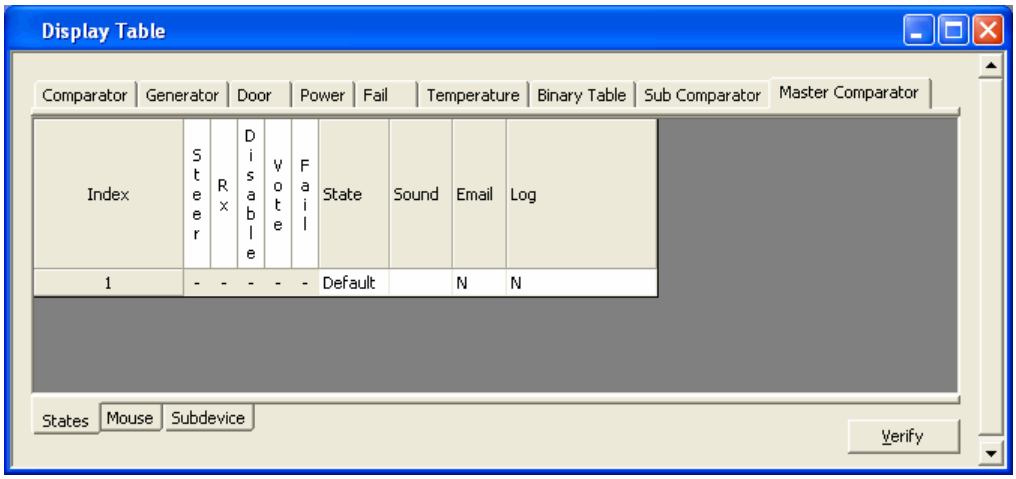
To add a tab for a new device to properly handle information from the Master Comparator in our example system, right-click on one of the existing tabs, then click on ***Append New Table***. The following window will be displayed. Type in a new **Tab Name,** such as "Master Comparator".

Then select the number of status **Input Bits** that this new device will possess. This Master Comparator display table will have nearly the same function as the predefined "Comparator" Display Table, so in this case, the number of **Input Bits** should be set to 5. Click on **OK** to close this window.



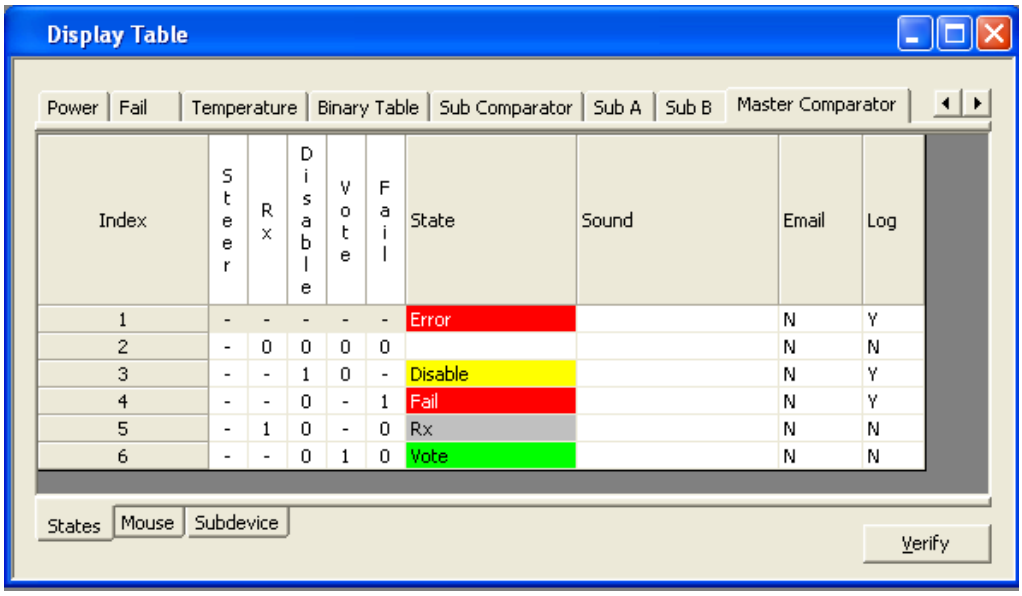
States Tab

After the table is shown, we have to add the bit names as shown below. Note that the bit order is not random; it must match the bits as they are received from the CIB modules.



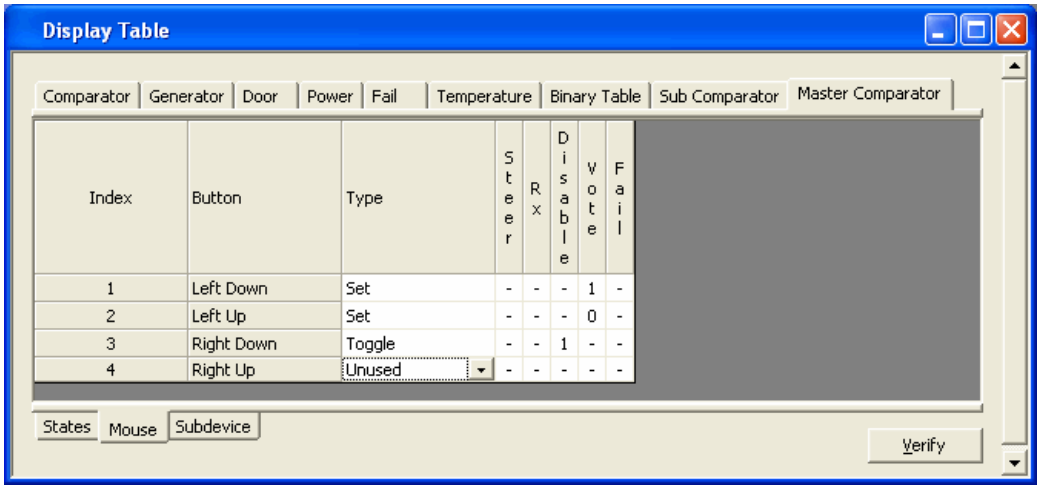
If the Master Comparators will never be displayed in an Equipment-Centric view, we could live with a minimalistic state table as shown above. No additional lines would need to be added to define states,

However, we've filled out the Master Comparator table as shown below so that a Master Comparator can be displayed in an equipment-centric view.



Mouse Tab

Next, the **Mouse** tab for this "Master Comparator" display table should be modified to appear as follows.



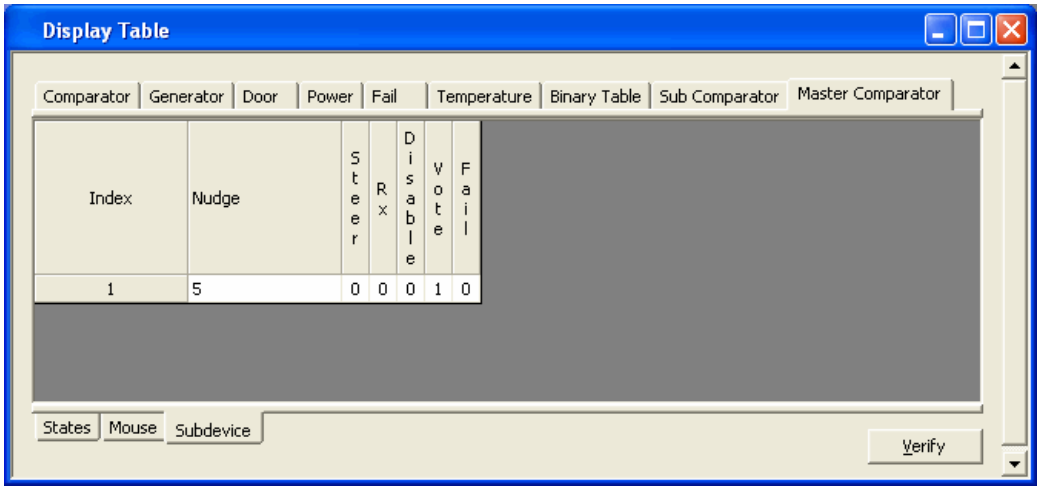
SubDevice Tab

Finally, the **SubDevice** tab for this "Master Comparator" display table must be altered to pass its "Vote" bit correctly to the Sub Comparator display table created earlier. Since the "Vote" of the Master Comparator must be passed to display the proper status of the "Virtual Comparator", that bit should be masked by setting it to "1" as in the following window.

Before the Master Comparator status information is sent to the Sub Comparator status information for proper display of a "Virtual Comparator", this Master Comparator data is altered in two ways.

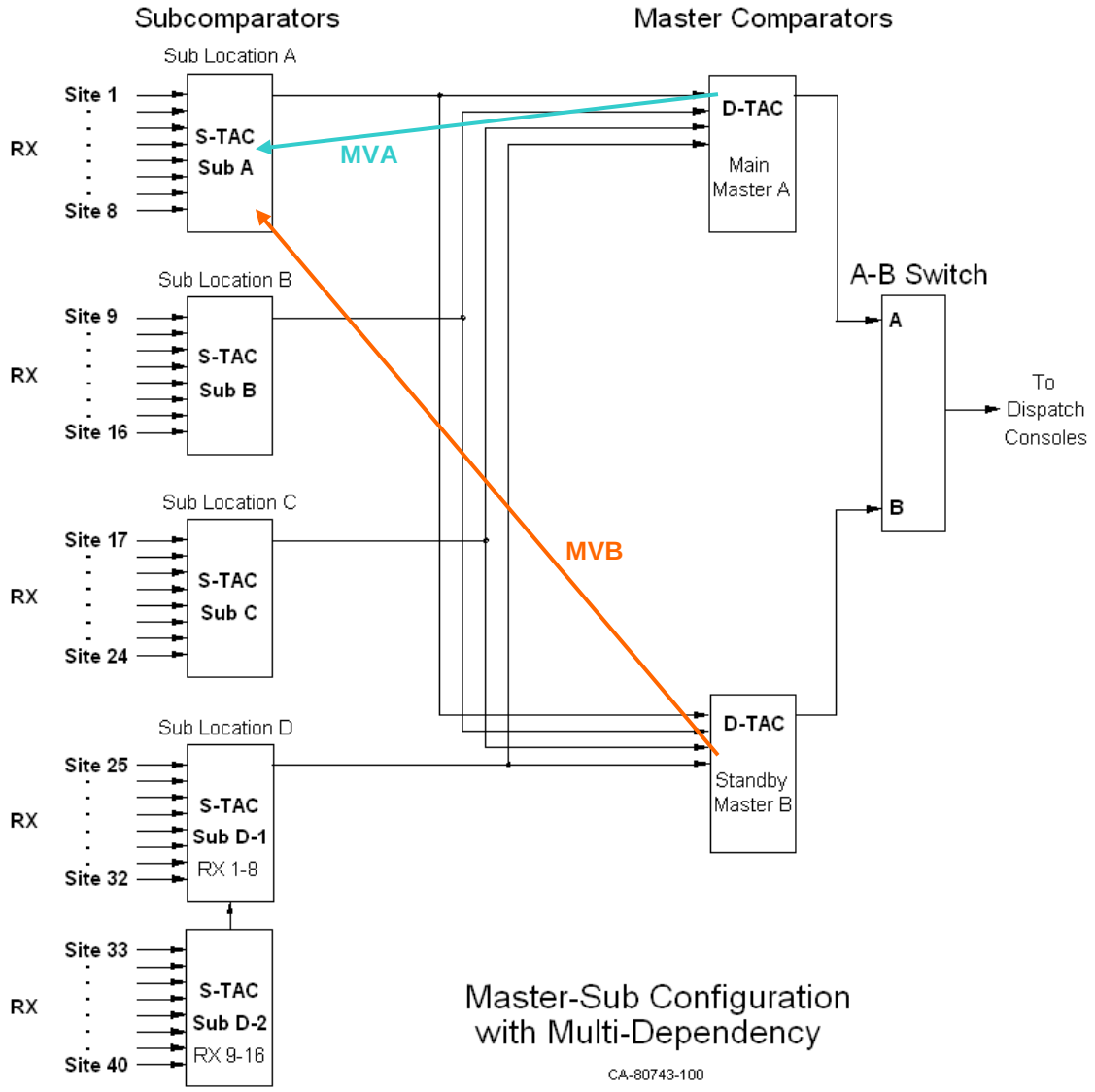
- First, the data for any single status bit that is masked in the "SubDevice" tab will be promoted to the least significant (right-most) bit of the status word.
- Second, the data in that least significant bit (Bit 0) will be "Nudged" a number of places to the left (specified in the "Nudge" column) so that it appears in the correct bit location for the Sub Comparator status.

For this example, the **States** tab for the "Sub Comparator" was modified earlier to specify that Bit 5 will hold the "Vote" status from the Master Comparator. So the bit must be "Nudged" from Bit 0 to Bit 5. Since the Bit is being nudged 5 places to the left, the "Nudge" parameter in the following display is set to 5.



Configuring Master-Sub Comparator with Multi-Dependency

The features described in the previous "Master-Sub Comparator Configuration" section can be used in a more complex arrangement that adds "Multi-Dependency". Multi-Dependency can be defined as the ability of a Sub Comparator to inherit status bits from multiple Master Comparators. This arrangement provides a level of redundancy and is depicted in the following diagram.



With multiple masters as in this example, Sub Comparator status bits will be inherited from both Master Comparators. The above diagram illustrates this for the first Sub Comparator with Master Vote A (MVA) and Master Vote B (MVB) vectors. Likewise, the other Sub Comparators in this system will also inherit status bits from both Master Comparators.

Multidependency will let you display this system as two virtual comparators:

- Virtual Comparator A using the Sub Comparators and Master A and
- Virtual Comparator B using the Sub Comparators and Master B.

The previous discussion under the ***Multi-Bit Mask*** section on page ***176*** will be used to build the Display Tables for this system.

First we need to get the Vote bits from Master A and Master B passed down to the Sub Comparators. The diagram below shows that the Master Vote bit will be masked and passed to the SubDevice. The Master A Vote will be nudged 5 bits, and the Master B Vote will be nudged 6 bits.

Master Comparator B

Master B Bits			Steer	Rx	Dis	Vote	Fail
Mask			0	0	0	1	0
Masked						Vote	
Compressed & Shifted							Vote

Master Comparator A

Master A Bits			Steer	Rx	Dis	Vote	Fail
Mask			0	0	0	1	0
Masked						Vote	
Compressed & Shifted							Vote

Sub Comparators

Master A Nudged (5) Master B Nudged (6)	Master B Vote	Master A Vote					
Sub Comparator Bits	Master B Vote (Inherited)	Master A Vote (Inherited)	Steer	Rx	Dis	Vote	Fail

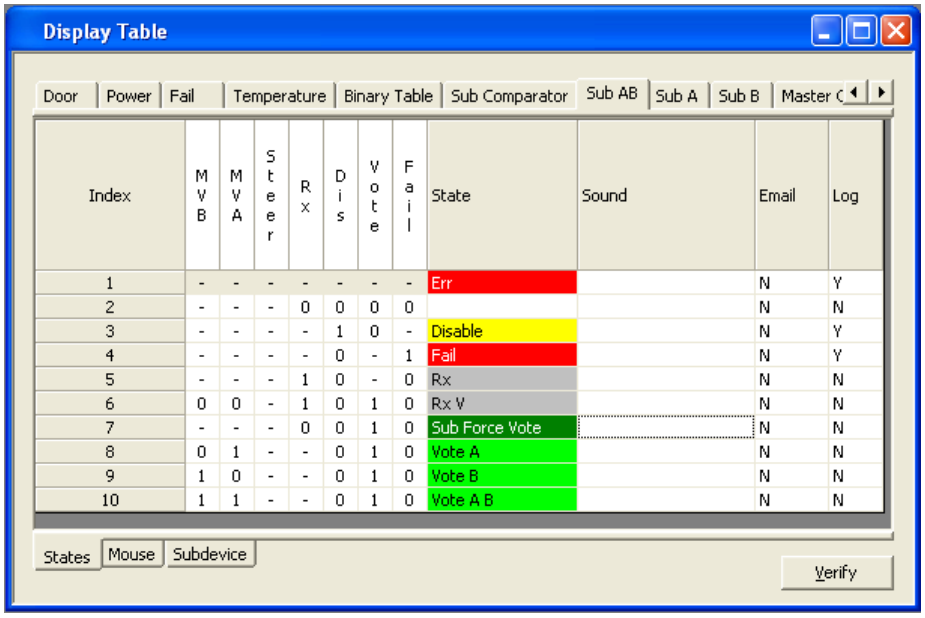
Inherited bits "Native" bits from Sub Comparator CIB

To accomplish the above, set up the following parameters:

- Sub Comparator Display Table(s) with slots for Master Vote A & B
- Master A Display Table with Vote Bit Nudge = 5
- Master B Display Table with Vote Bit Nudge = 6
- Master A Comparator Receiver slot Sub Devices: Sub Comparators
- Master B Comparator Receiver slot Sub Devices: Sub Comparators

Composite Sub Comparator Display Table

A Composite Sub Comparator display table can be built as shown below:



Index	MVB	MVA	Steer	Rx	Dis	Vote	Fail	State	Sound	Email	Log
1	-	-	-	-	-	-	-	Err		N	Y
2	-	-	-	0	0	0	0			N	N
3	-	-	-	-	1	0	-	Disable		N	Y
4	-	-	-	-	0	-	1	Fail		N	Y
5	-	-	-	1	0	-	0	Rx		N	N
6	0	0	-	1	0	1	0	Rx V		N	N
7	-	-	-	0	0	1	0	Sub Force Vote		N	N
8	0	1	-	-	0	1	0	Vote A		N	N
9	1	0	-	-	0	1	0	Vote B		N	N
10	1	1	-	-	0	1	0	Vote A B		N	N

This can be used for somewhat of an equipment-centric view, but with added information about whether or not this sub comparator is also voted by the master comparator(s). This display might be useful for a technician.

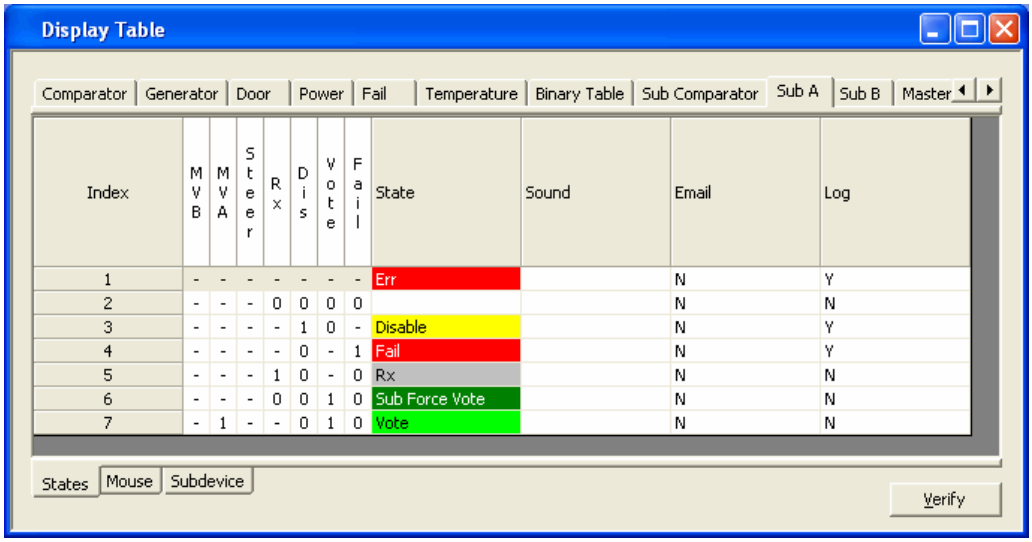
Multiple Views of the Virtual Comparators

For a dispatcher, it is helpful to be able to display the example system as two virtual comparators:

- Virtual Comparator A using the sub comparators and Master A and
- Virtual Comparator B using the sub comparators and Master B.

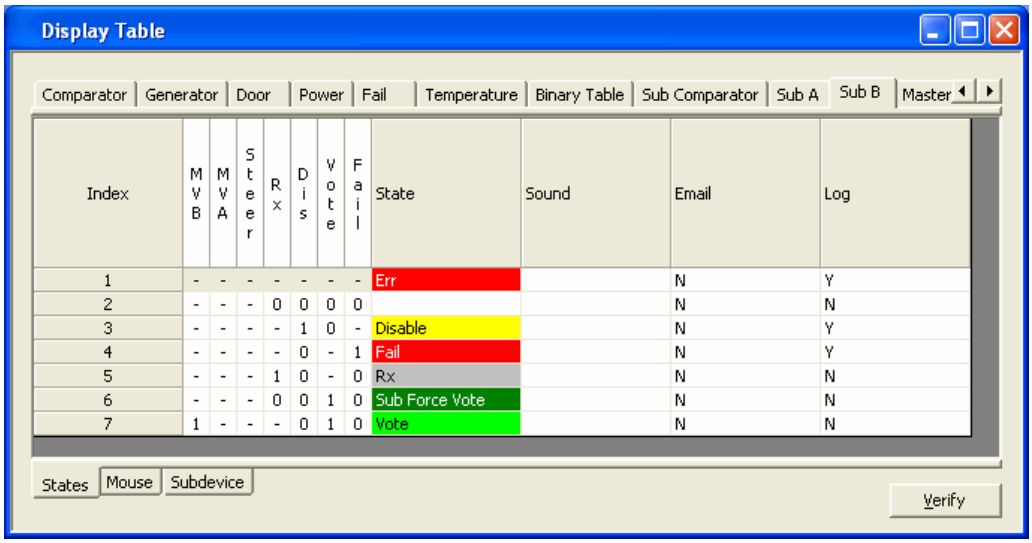
To do this, we need a Sub Comparator Display Table for both virtual comparators as shown below:

For Virtual Comparator A:



For this view, the dispatcher is interested only in what receiver is being used through the Master A comparator. This Display table shows a "Vote" only when the Master A comparator has selected the sub comparator. It ignores what the Master B comparator is doing.

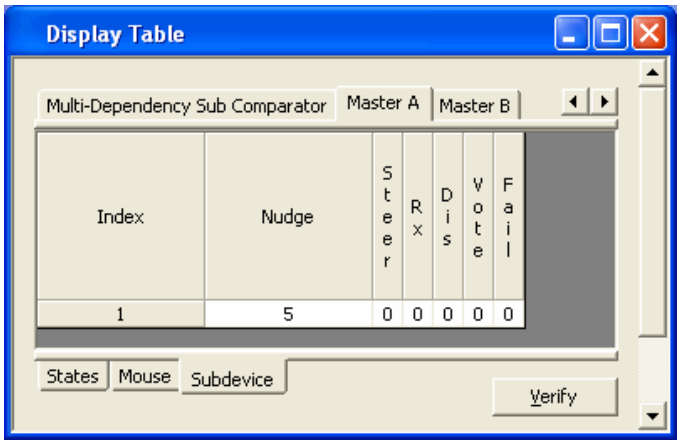
For Virtual Comparator B:



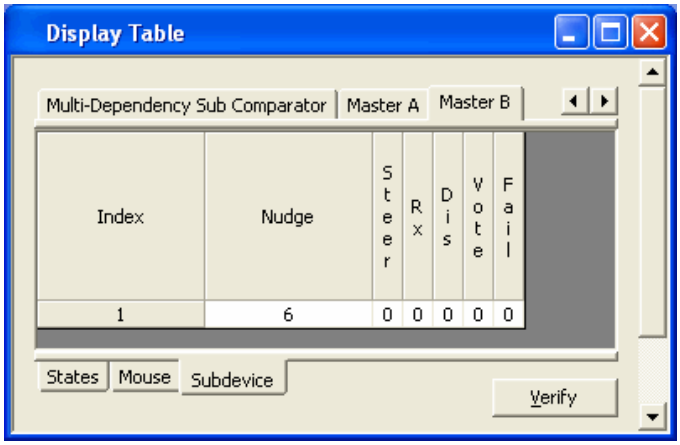
For this view, the dispatcher is interested only in what receiver is being used through the Master B comparator. This Display table shows a "Vote" only when the Master B comparator has selected the sub comparator. It ignores what the Master A comparator is doing.

Master Comparators

For the Master A Comparator, the SubDevices Tab of the Display Table should appear as in the following.



And for the Master B Comparator, the SubDevices tab of the Display Table should appear as in the following.

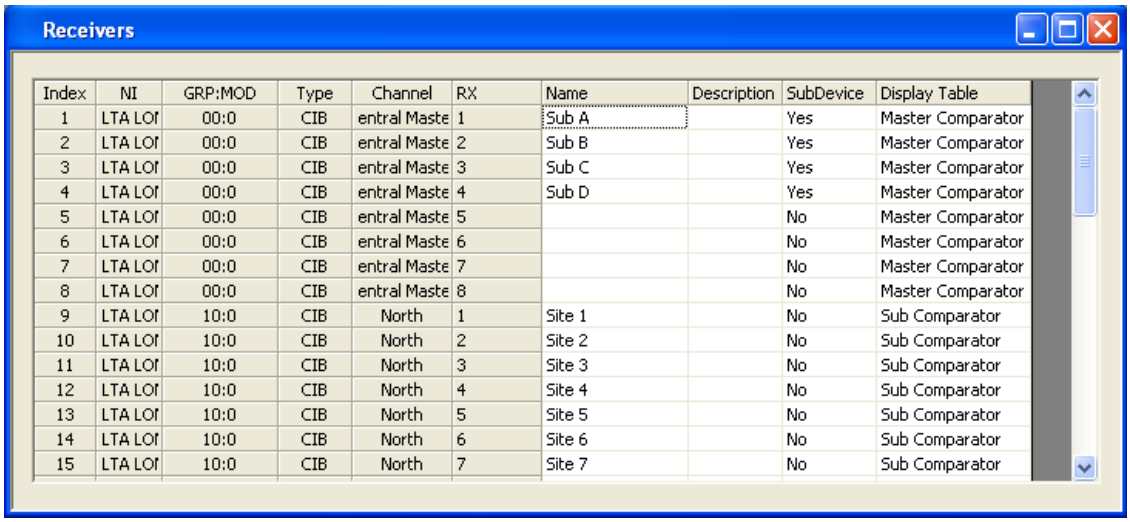


Multiple Views: Display Table Override

So we may have a number of Display Tables set up to view a master or sub comparator, for example:

- Equipment-Centric
- Virtual Comparator
- Enhanced Virtual Comparator
- Composite Sub Comparator
- Sub A
- Sub B

Looking at the Receiver window below, you'll see only one value for Display Table for each receiver.



Index	NI	GRP:MOD	Type	Channel	RX	Name	Description	SubDevice	Display Table
1	LTA LOf	00:0	CIB	entral Maste	1	Sub A		Yes	Master Comparator
2	LTA LOf	00:0	CIB	entral Maste	2	Sub B		Yes	Master Comparator
3	LTA LOf	00:0	CIB	entral Maste	3	Sub C		Yes	Master Comparator
4	LTA LOf	00:0	CIB	entral Maste	4	Sub D		Yes	Master Comparator
5	LTA LOf	00:0	CIB	entral Maste	5			No	Master Comparator
6	LTA LOf	00:0	CIB	entral Maste	6			No	Master Comparator
7	LTA LOf	00:0	CIB	entral Maste	7			No	Master Comparator
8	LTA LOf	00:0	CIB	entral Maste	8			No	Master Comparator
9	LTA LOf	10:0	CIB	North	1	Site 1		No	Sub Comparator
10	LTA LOf	10:0	CIB	North	2	Site 2		No	Sub Comparator
11	LTA LOf	10:0	CIB	North	3	Site 3		No	Sub Comparator
12	LTA LOf	10:0	CIB	North	4	Site 4		No	Sub Comparator
13	LTA LOf	10:0	CIB	North	5	Site 5		No	Sub Comparator
14	LTA LOf	10:0	CIB	North	6	Site 6		No	Sub Comparator
15	LTA LOf	10:0	CIB	North	7	Site 7		No	Sub Comparator

How do we use all these different Display Tables to take a different view of the comparators?

The secret is to use the **Display Table Override** in the **Display Windows**.

When a receiver is placed in a Display Window, you can use a special Display Table *for that instance* of the receiver by using the Display Table Override.

For example, if you want to display a system in two ways:

- Virtual Comparator A (using Master A comparator)
- Virtual Comparator B (using Master B comparator)

You would set up a one tab for each Virtual Comparator as shown below:

Virtual Comparator A

Sub Comparator A		Sub Comparator B		Sub Comparator C		Sub Comparator D-1		Sub Comparator D-2	
Site 1		Site 9		Site 17	Rx	Site 25		Site 33	
Site 2	Rx	Site 10		Site 18	Vote	Site 26		Site 34	
Site 3	Rx	Site 11	Rx	Site 19	Rx	Site 27	Rx	Site 35	Dis
Site 4	Rx	Site 12		Site 20		Site 28	Rx	Site 36	
Site 5	Rx	Site 13		Site 21	Rx	Site 29		Site 37	
Site 6	Rx	Site 14	Rx	Site 22		Site 30		Site 38	
Site 7		Site 15	Rx	Site 23	Rx	Site 31		Site 39	
Site 8	Dis	Site 16		Site 24		Site 32		Site 40	

Virtual Comparator B

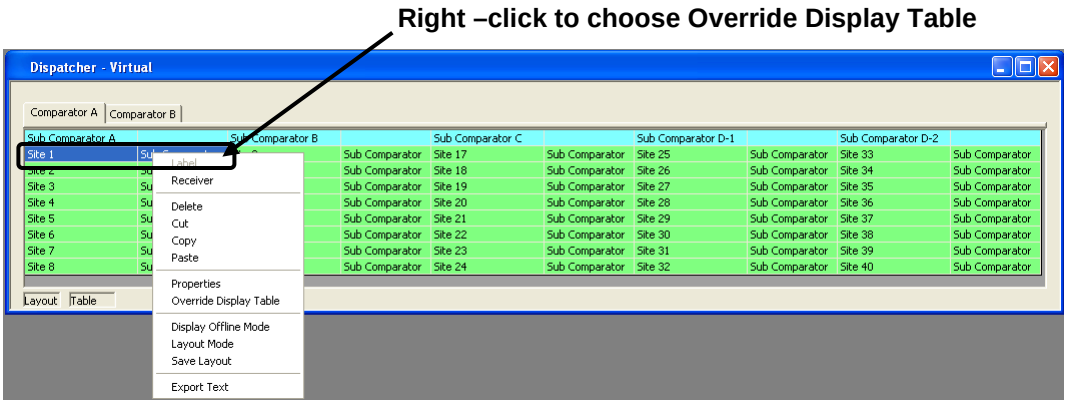
Sub Comparator A		Sub Comparator B		Sub Comparator C		Sub Comparator D-1		Sub Comparator D-2	
Site 1		Site 9		Site 17	Rx	Site 25		Site 33	
Site 2	Rx	Site 10		Site 18	Rx	Site 26		Site 34	
Site 3	Rx	Site 11	Rx	Site 19	Rx	Site 27	Rx	Site 35	Dis
Site 4	Vote	Site 12		Site 20		Site 28	Rx	Site 36	
Site 5	Rx	Site 13		Site 21	Rx	Site 29		Site 37	
Site 6	Rx	Site 14	Rx	Site 22		Site 30		Site 38	
Site 7		Site 15	Rx	Site 23	Rx	Site 31		Site 39	
Site 8	Dis	Site 16		Site 24		Site 32		Site 40	

The Display Windows are similar, with the following differences:

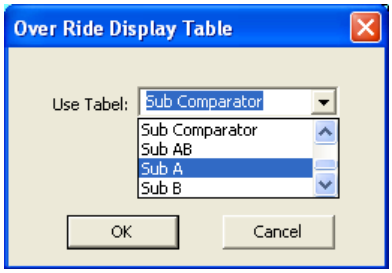
- Master Comparator A is voting Sub Comparator C and using Rx 18.
- Master Comparator B is voting Sub Comparator A and using Rx 4.

If the Dispatcher had the A-B switch in position "A", he would hear audio from Rx 18. If he had it in the "B" position, he would be hearing Rx 4.

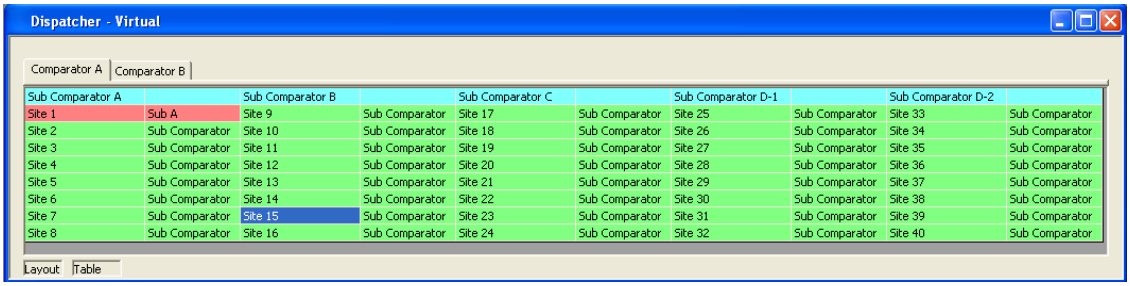
To build this display we us the Display Table Override feature. For each receiver in a Display Window that will use a different Display Table than chosen in the Receivers Window, right-click its cell in the Display Window as shown below.



Then click the **Override Display Table** menu item to display the following window.



Choose Sub A, and then click **OK**. The Display Window will indicate receivers with Display Table Overrides with a Reddish background as shown below. The cells for other receivers using their default Display Table will have a green background.

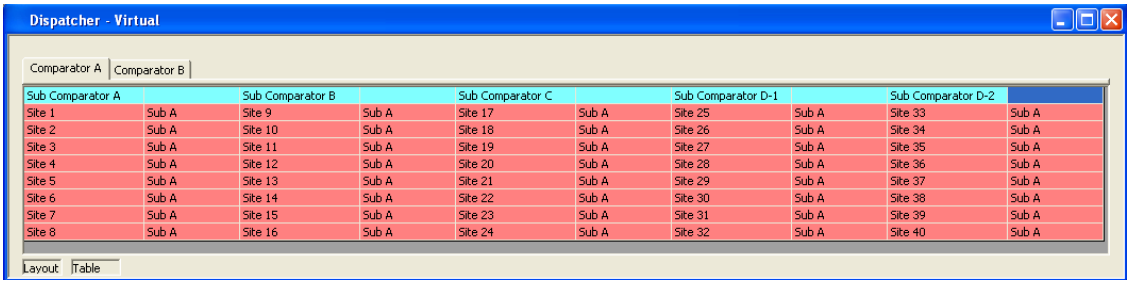


Repeat this procedure for each receiver that should have an override for the default Display Table.

The Display Table for all receivers of a comparator can be overridden. And taking it a step further, the Display Table for all receivers in a Display Window can be overridden. To apply Display Table Overrides to many receivers at once, perform the following steps:

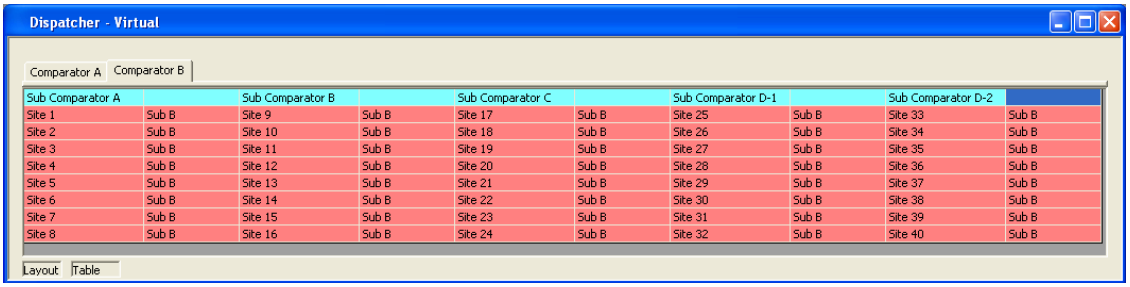
- Select all receivers that you wish to override with a type of Display Table.
- Right-click the selection, then click the **Override Display Table** menu item to display the Override Display Table window.
- Select the proper Display Table from the list, then click **OK**.

If all receivers in the above Display Window were selected to be overridden with Sub A Display Table, the Display Window would appear as follows.



Sub Comparator A		Sub Comparator B		Sub Comparator C		Sub Comparator D-1		Sub Comparator D-2	
Site 1	Sub A	Site 9	Sub A	Site 17	Sub A	Site 25	Sub A	Site 33	Sub A
Site 2	Sub A	Site 10	Sub A	Site 18	Sub A	Site 26	Sub A	Site 34	Sub A
Site 3	Sub A	Site 11	Sub A	Site 19	Sub A	Site 27	Sub A	Site 35	Sub A
Site 4	Sub A	Site 12	Sub A	Site 20	Sub A	Site 28	Sub A	Site 36	Sub A
Site 5	Sub A	Site 13	Sub A	Site 21	Sub A	Site 29	Sub A	Site 37	Sub A
Site 6	Sub A	Site 14	Sub A	Site 22	Sub A	Site 30	Sub A	Site 38	Sub A
Site 7	Sub A	Site 15	Sub A	Site 23	Sub A	Site 31	Sub A	Site 39	Sub A
Site 8	Sub A	Site 16	Sub A	Site 24	Sub A	Site 32	Sub A	Site 40	Sub A

Likewise, for Comparator B, the result would look like:



Sub Comparator A		Sub Comparator B		Sub Comparator C		Sub Comparator D-1		Sub Comparator D-2	
Site 1	Sub B	Site 9	Sub B	Site 17	Sub B	Site 25	Sub B	Site 33	Sub B
Site 2	Sub B	Site 10	Sub B	Site 18	Sub B	Site 26	Sub B	Site 34	Sub B
Site 3	Sub B	Site 11	Sub B	Site 19	Sub B	Site 27	Sub B	Site 35	Sub B
Site 4	Sub B	Site 12	Sub B	Site 20	Sub B	Site 28	Sub B	Site 36	Sub B
Site 5	Sub B	Site 13	Sub B	Site 21	Sub B	Site 29	Sub B	Site 37	Sub B
Site 6	Sub B	Site 14	Sub B	Site 22	Sub B	Site 30	Sub B	Site 38	Sub B
Site 7	Sub B	Site 15	Sub B	Site 23	Sub B	Site 31	Sub B	Site 39	Sub B
Site 8	Sub B	Site 16	Sub B	Site 24	Sub B	Site 32	Sub B	Site 40	Sub B

Note that in this system, the default Display table for these sub comparators was "Subcomparator". We would probably use the default for an equipment-centric view. For this dispatcher display, however, both views use Display Table Overrides.

Note: Default Display Tables

The MCNRCD program passes bits downstream from a Master device to sub devices using the Display table that is in the Receiver window. You must use the proper Display Table (the one with the Sub Device Bit Mask & Nudge) as the default Display Table in the Receiver window.

Configuring Triggered Output Actions (Licensed Option)

The Triggered Output Actions option in the MCN Server software provides the means for an Input Event to trigger an Output Action. This option can be used, for example, to provide alarm outputs (from a CIB or GPIO module) to an external device when a failure on one or more input devices occurs.

Typical uses would include:

Input Events	Output Action
Failed receivers on a channel	Turn on Channel Failure Alarm Output
Microwave Alarm	Turn on Microwave Failure Alarm Output
Any abnormal condition at a site	Turn on composite Site Alarm Output
Alarm Acknowledgement input	Turn off Alarm Relay

An output can be triggered by one or many input events, but an input event can trigger only one output action.

Setting up Triggered Output Actions involves configuring the following items:

- Triggered Output Types
- Triggers
- Output Function Blocks (the specific physical outputs on a CIB or GPIO module)
- Linkages between specific inputs and specific output function blocks.

Triggered Output Types

Set up the Triggered Output Types in the Display Table window. Each Triggered Output Type is defined in its own Display Table tab. Normally, only one or two Triggered Output Types are defined. You will use the Triggered Output Type as the Display Table for the specific Output Function Blocks. Things to define for Triggered Output Types are:

- Triggered Output Type Name (Display Table Name)
- Number of Bits
  Usually just a single bit is used for alarm outputs, but you could implement multi-bit alarms such as Major and Minor alarms or Fail and Disable alarms for comparators.
- Bit Names
  Typically "Alarm" in a one-bit Output Type
  In a multi-bit output type, the bits could be named "Major" and "Minor", etc.
- States to display on the PC (ex: "Normal" & "Alarm") and their colors
- Mouse Functions (typically to reset or acknowledge an alarm)
- Actions for the Input Event to trigger
  ex: Set Alarm or Reset Alarm
  Set Major, Set Minor, Reset Major, Reset Minor, Reset All

In most systems, one Triggered Output Type can be used for all the alarm Output Function Blocks. You would need to make multiple Triggered Output Types if:

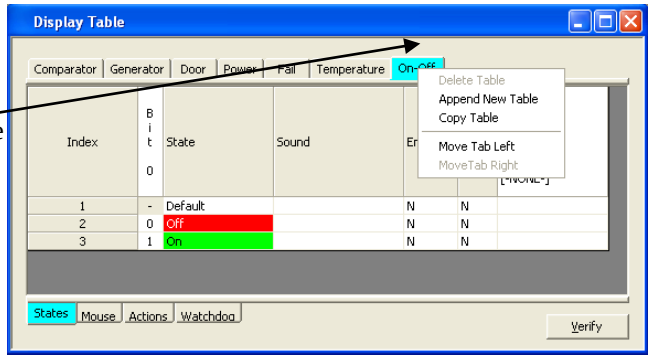
- You needed different status texts or colors to be displayed for different Output Types or
- You need both single bit and multi bit Triggered Output Types

Building a New Triggered Output Type

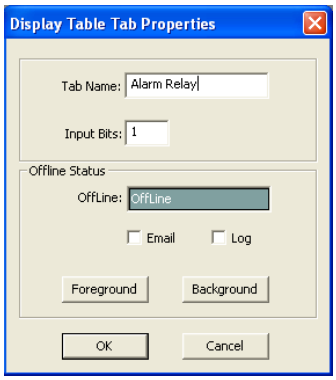
New Triggered Output Types are built just like normal Display Tables.

1. Start in the Display Table Window.

2. Right-Click on the top Display Table
   Append New Table.



3. Enter the Triggered Output Type (Display Table) in the ***Tab Name*** field.
   Set up the number of bits in the ***Input Bits*** field.
   Hit ***OK***.



4. Select the ***States*** tab on the bottom of the window.

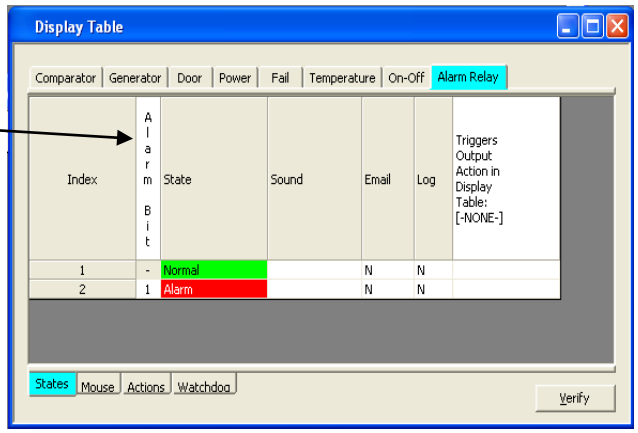
   Enter the Bit Names

   Enter the State values, texts and colors

   (Add new states by right-clicking and selecting ***Append***.)

   Enable logging if desired.

   Do not enter anything in the ***Triggers Output Action*** column. (This is an output that *receives* a trigger.)

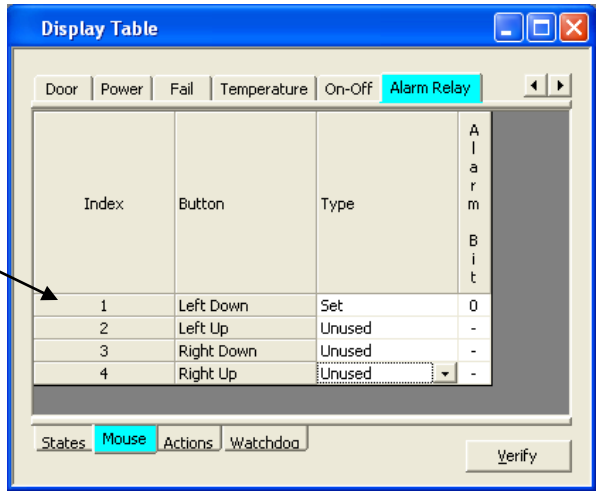


5. Select the ***Mouse*** tab at the bottom of the window.

Enter appropriate Mouse function(s)

We have added the ability to reset the alarm relay with the left mouse button (**Set** the state to **0**).

You could also set up a mouse function to set the alarm (Set to 1) if you desire.



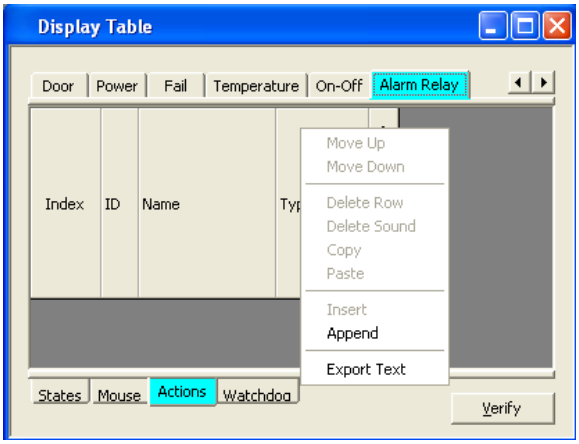
At this stage, we've set up a standard single-bit Display Table entry.

We'll now add the Output Actions that make a standard Display Table a Triggered Output Type.

6. Select the Actions tab on the bottom of the window. This is where we enter the Output Actions.

A new Display Table starts out with no Output Actions.

Right-Click on the header row and select Append from the menu.



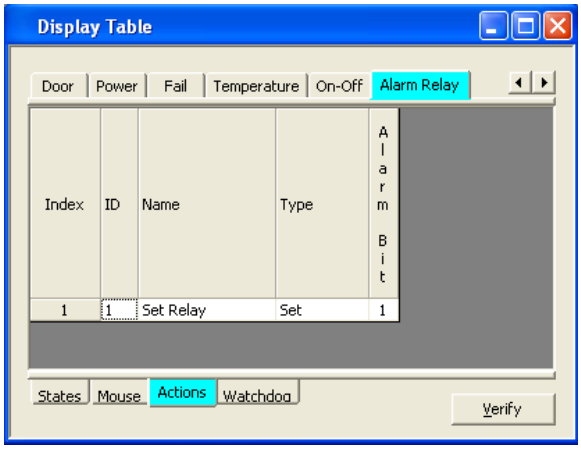
7. Enter an ID number, and a descriptive Name

The Output Actions are very similar to the Mouse functions. You can Set a bit to a 1 or 0, Toggle a bit, or ignore a bit.

Select an Action type
(Set, Toggle, or Unused).

Select a bit Value
(1, 0, or Don't Care)

The Set action type sets a bit to either a 1 or 0 as selected in the bit field.

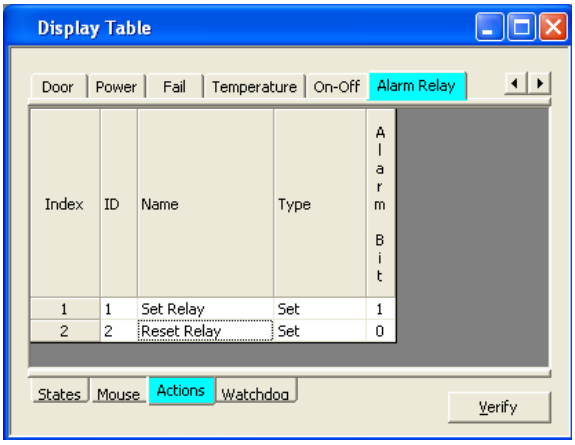


8. Repeat the above to add any additional actions required.

   Normally when using Triggered Outputs, you would only Set (to 1) outputs when an input event occurs. You'll normally reset the alarm bit manually.

   You can, however, set up both a Set and Reset action that can be used with input events as shown to the right.

   To reset a bit, select **Set** and a bit value of 0.



This completes the definition of a Triggered Output Type.

Triggers

Triggers are set up in the State tab of the Input Display Table for the inputs that will be generating the trigger events. You will normally just be adding triggers to existing input Display Tables. For each Input Display Table you'll need to:

- Select an Output Device Type to associate the Input Display Table with and
- Select an Output Action to trigger for various input states.

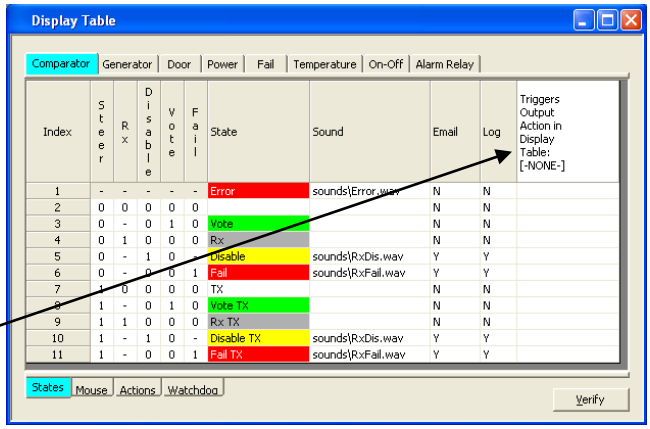
Setting up Triggers

1. Start in the ***Display Table*** window.

   Select the ***States*** tab on the bottom tabs.

   Select the desired Input Display Table on the top tabs.

   Double click on ***Triggers Output Action Display Table*** cell.

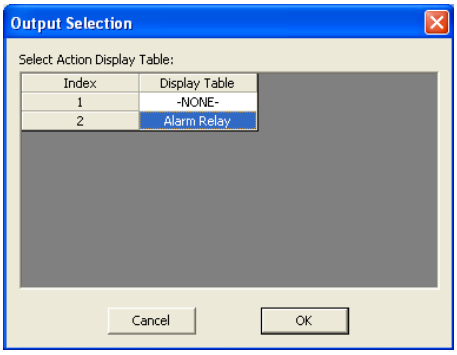


2. The ***Output Selection*** window will open.

   The Output Device Types you have configured with Actions will show up in the list of Display Tables.

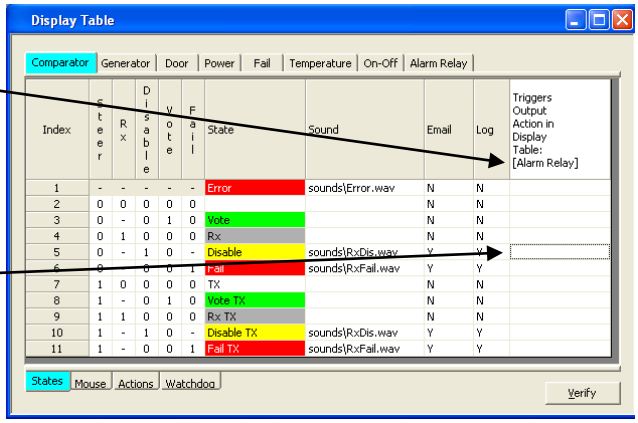
   Select the appropriate ***Display Table*** for your Output Device type.

   Hit ***OK***



3. The selected Output Device Type will be displayed in the ***Triggers Output Action Display Table*** cell.

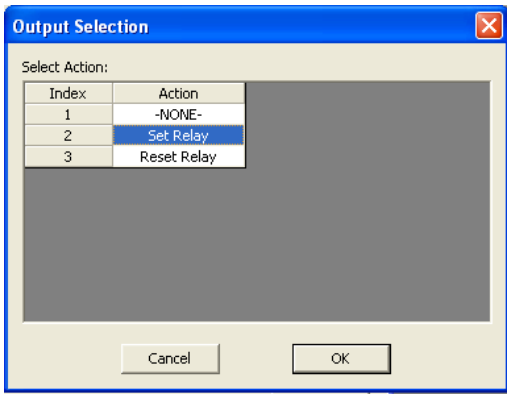
   Select a Trigger State and double-click in the far right column



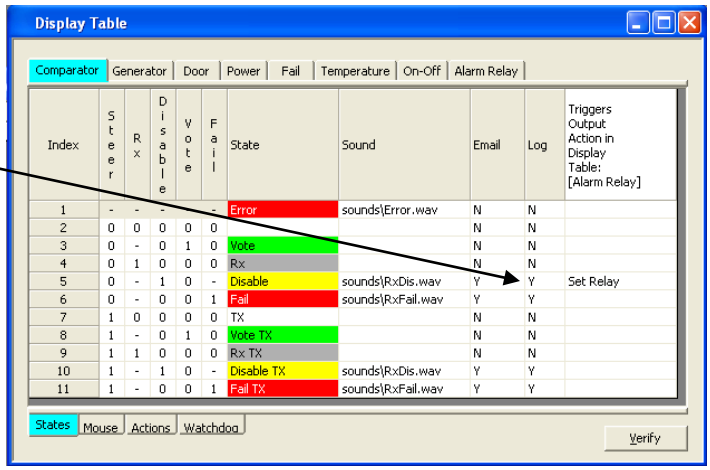
4. The Actions from the selected Output Display Table will be displayed.

   Select the desired Output Action

   Hit **OK**.



5. The Output Action will be displayed in the far right column

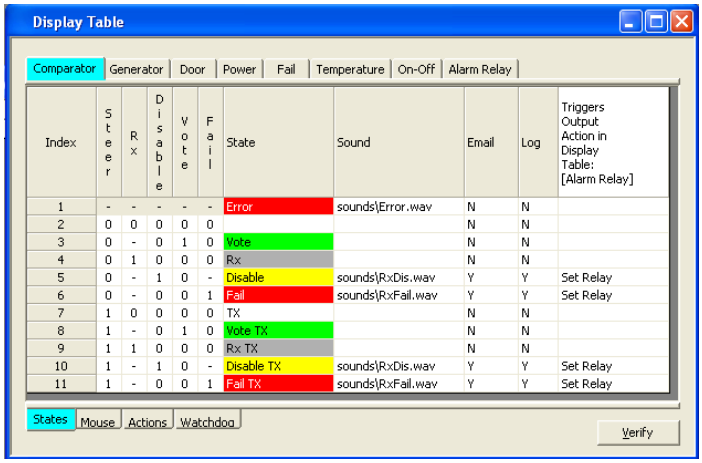

Display Table
Comparator
Generator
Door
Power
Fail
Temperature
On-Off
Alarm Relay
Index
Steer
Rx
Disable
Vote
Fail
State
Sound
Email
Log
Triggers Output Action in Display Table: [Alarm Relay]
1 - - - - - Error sounds\Error.wav N N
2 0 0 0 0 0 N N
3 0 - 0 1 0 Vote N N
4 0 1 0 0 0 Rx N N
5 0 - 1 0 - Disable sounds\RxDis.wav Y Y Set Relay
6 0 - 0 0 1 Fail sounds\RxFail.wav Y Y
7 1 0 0 0 0 TX N N
8 1 - 0 1 0 Vote TX N N
9 1 1 0 0 0 Rx TX N N
10 1 - 1 0 - Disable TX sounds\RxDis.wav Y Y
11 1 - 0 0 1 Fail TX sounds\RxFail.wav Y Y
States
Mouse
Actions
Watchdog
Verify

.

6. Repeat the above steps for each of the states in the Input Device Table that you want to trigger an Output Action.

   In this example, we just set up triggers for the **Set Relay** output action. (We will manually reset the alarm relay.)

   You could use one or more input states to trigger the **Reset Relay** action if required.


Display Table
Comparator
Generator
Door
Power
Fail
Temperature
On-Off
Alarm Relay
Index
Steer
Rx
Disable
Vote
Fail
State
Sound
Email
Log
Triggers Output Action in Display Table: [Alarm Relay]
1 - - - - - Error sounds\Error.wav N N
2 0 0 0 0 0 N N
3 0 - 0 1 0 Vote N N
4 0 1 0 0 0 Rx N N
5 0 - 1 0 - Disable sounds\RxDis.wav Y Y Set Relay
6 0 - 0 0 1 Fail sounds\RxFail.wav Y Y Set Relay
7 1 0 0 0 0 TX N N
8 1 - 0 1 0 Vote TX N N
9 1 1 0 0 0 Rx TX N N
10 1 - 1 0 - Disable TX sounds\RxDis.wav Y Y Set Relay
11 1 - 0 0 1 Fail TX sounds\RxFail.wav Y Y Set Relay
States
Mouse
Actions
Watchdog
Verify

This completes the definition of a Trigger.

You can add triggers to other Input Display Tables as required.

Linking Inputs to Outputs

In the previous steps, we've set up Output Types and Trigger types. We now need to link actual inputs to actual outputs. To link an input to an output, we need to do the following:

1. Set up the actual Alarm Output Points on a device that supports outputs (CIB, GPIO module). Each Alarm Output Point must use an Output Display Table (that has an Action set in it).
2. Set up the actual input points (receivers, alarm input points, etc.) that will trigger the Output Actions. Each Input Point must use an Input Display Table that has one or more Triggers in it.
3. Link the actual input point to the actual output point.

The Input Display Table in step 2 must point to the Output Display Table in step 1.

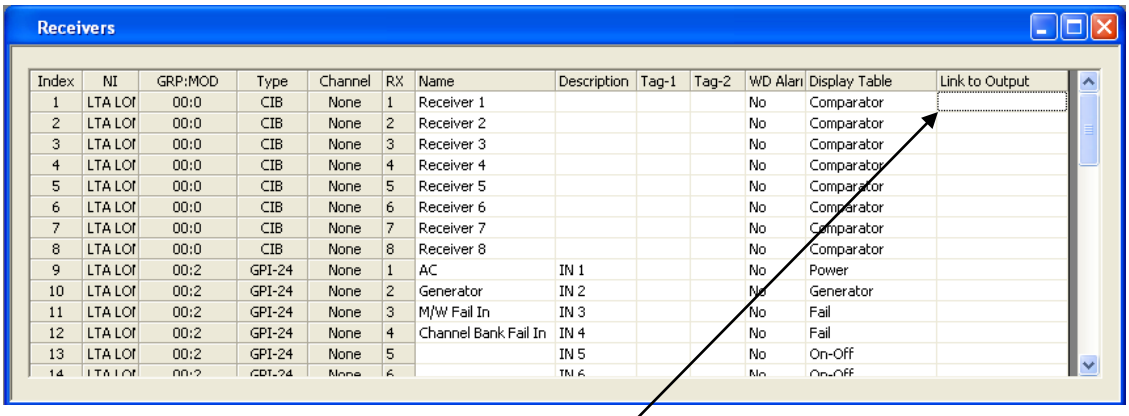
(Although we refer to Input Display Tables and Output Display Tables, they are not specifically identified as such in the program – they are all Display Tables. The difference is that Input Display Tables have Triggers and Output Display Tables have Actions.)

Setting up the Links

In this section, it is assumed that you have already:

- Set up the appropriate Input Modules (CIBs, AIBs, GPIO modules) in the Hardware window,
- Named the input points (receivers, alarm inputs, etc.) in the Receiver window,
- Selected an appropriate Input Display Table for each of the Input Points,
- Set up the appropriate Output Modules (CIBs, GPIO Modules, etc.) in the Hardware window,
- Named the Output Points (Alarm relays, etc..) in the Receiver window,
- Selected an appropriate Output Display Table for each of the Output Points

1. Start in the ***Receiver*** window.


Receivers
Index NI GRP:MOD Type Channel RX Name Description Tag-1 Tag-2 WD Aları Display Table Link to Output
1 LTA LOf 00:0 CIB None 1 Receiver 1 No Comparator
2 LTA LOf 00:0 CIB None 2 Receiver 2 No Comparator
3 LTA LOf 00:0 CIB None 3 Receiver 3 No Comparator
4 LTA LOf 00:0 CIB None 4 Receiver 4 No Comparator
5 LTA LOf 00:0 CIB None 5 Receiver 5 No Comparator
6 LTA LOf 00:0 CIB None 6 Receiver 6 No Comparator
7 LTA LOf 00:0 CIB None 7 Receiver 7 No Comparator
8 LTA LOf 00:0 CIB None 8 Receiver 8 No Comparator
9 LTA LOf 00:2 GPI-24 None 1 AC IN 1 No Power
10 LTA LOf 00:2 GPI-24 None 2 Generator IN 2 No Generator
11 LTA LOf 00:2 GPI-24 None 3 M/W Fail In IN 3 No Fail
12 LTA LOf 00:2 GPI-24 None 4 Channel Bank Fail In IN 4 No Fail
13 LTA LOf 00:2 GPI-24 None 5 IN 5 No On-Off

Double click in ***Link To Output*** field for an input point.

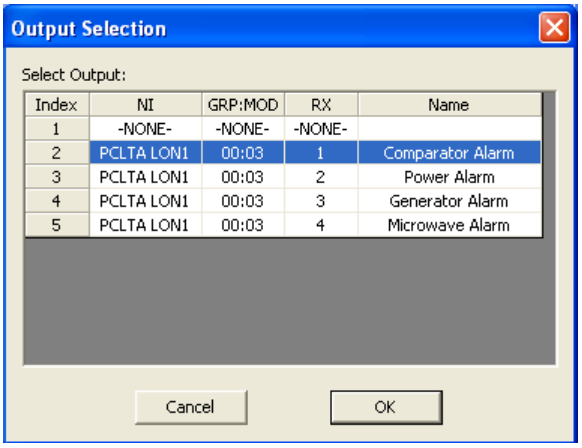
2. An Output Selection window will appear.

   In this system, we have 4 output alarms set up.

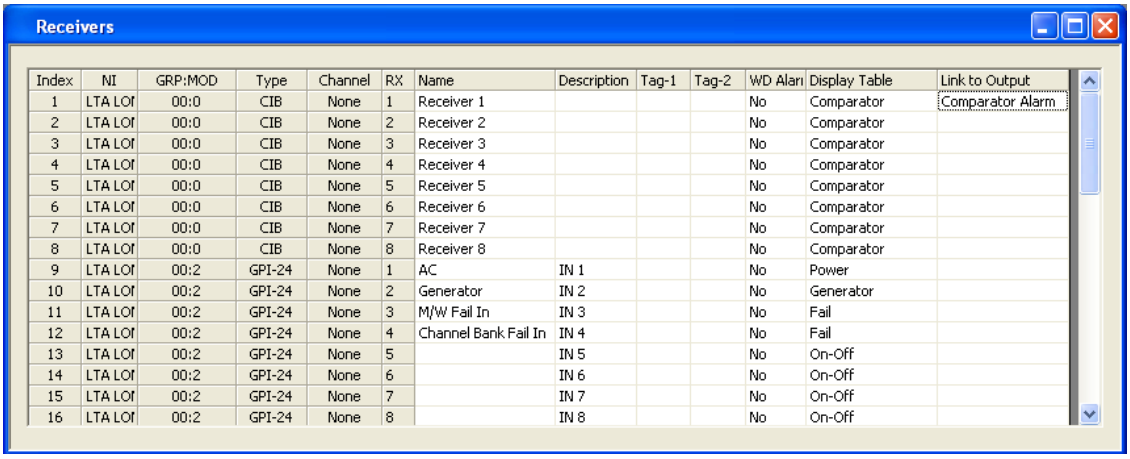
   Select the proper Output Point.

   (This is a receiver input to a comparator, so we will choose "Comparator Alarm".

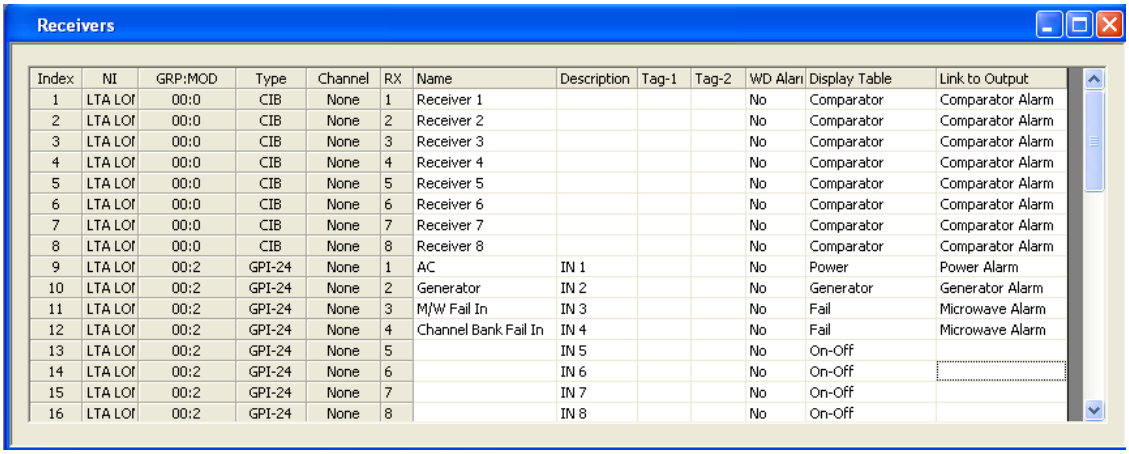
   Hit ***OK***


Output Selection
Select Output:
Index NI GRP:MOD RX Name
1 -NONE- -NONE- -NONE-
2 PCLTA LON1 00:03 1 Comparator Alarm
3 PCLTA LON1 00:03 2 Power Alarm
4 PCLTA LON1 00:03 3 Generator Alarm
5 PCLTA LON1 00:03 4 Microwave Alarm
Cancel
OK

3. The Output Point will appear in the ***Link To Output*** field


Receivers
Index NI GRP:MOD Type Channel RX Name Description Tag-1 Tag-2 WD Aları Display Table Link to Output
1 LTA LOf 00:0 CIB None 1 Receiver 1 No Comparator Comparator Alarm
2 LTA LOf 00:0 CIB None 2 Receiver 2 No Comparator
3 LTA LOf 00:0 CIB None 3 Receiver 3 No Comparator
4 LTA LOf 00:0 CIB None 4 Receiver 4 No Comparator
5 LTA LOf 00:0 CIB None 5 Receiver 5 No Comparator
6 LTA LOf 00:0 CIB None 6 Receiver 6 No Comparator
7 LTA LOf 00:0 CIB None 7 Receiver 7 No Comparator
8 LTA LOf 00:0 CIB None 8 Receiver 8 No Comparator
9 LTA LOf 00:2 GPI-24 None 1 AC IN 1 No Power
10 LTA LOf 00:2 GPI-24 None 2 Generator IN 2 No Generator
11 LTA LOf 00:2 GPI-24 None 3 M/W Fail In IN 3 No Fail
12 LTA LOf 00:2 GPI-24 None 4 Channel Bank Fail In IN 4 No Fail
13 LTA LOf 00:2 GPI-24 None 5 IN 5 No On-Off
14 LTA LOf 00:2 GPI-24 None 6 IN 6 No On-Off
15 LTA LOf 00:2 GPI-24 None 7 IN 7 No On-Off
16 LTA LOf 00:2 GPI-24 None 8 IN 8 No On-Off

4. Repeat the above to select the appropriate Output Points for the remaining Input Points.


Receivers
Index NI GRP:MOD Type Channel RX Name Description Tag-1 Tag-2 WD Aları Display Table Link to Output
1 LTA LOf 00:0 CIB None 1 Receiver 1 No Comparator Comparator Alarm
2 LTA LOf 00:0 CIB None 2 Receiver 2 No Comparator Comparator Alarm
3 LTA LOf 00:0 CIB None 3 Receiver 3 No Comparator Comparator Alarm
4 LTA LOf 00:0 CIB None 4 Receiver 4 No Comparator Comparator Alarm
5 LTA LOf 00:0 CIB None 5 Receiver 5 No Comparator Comparator Alarm
6 LTA LOf 00:0 CIB None 6 Receiver 6 No Comparator Comparator Alarm
7 LTA LOf 00:0 CIB None 7 Receiver 7 No Comparator Comparator Alarm
8 LTA LOf 00:0 CIB None 8 Receiver 8 No Comparator Comparator Alarm
9 LTA LOf 00:2 GPI-24 None 1 AC IN 1 No Power Power Alarm
10 LTA LOf 00:2 GPI-24 None 2 Generator IN 2 No Generator Generator Alarm
11 LTA LOf 00:2 GPI-24 None 3 M/W Fail In IN 3 No Fail Microwave Alarm
12 LTA LOf 00:2 GPI-24 None 4 Channel Bank Fail In IN 4 No Fail Microwave Alarm
13 LTA LOf 00:2 GPI-24 None 5 IN 5 No On-Off
14 LTA LOf 00:2 GPI-24 None 6 IN 6 No On-Off
15 LTA LOf 00:2 GPI-24 None 7 IN 7 No On-Off
16 LTA LOf 00:2 GPI-24 None 8 IN 8 No On-Off

Note that we have a number of Receivers in the comparator feeding the Comparator Alarm. Likewise, both the Microwave Fail and Channel Bank Fail feed the Microwave Alarm.

We have now configured the Input to Output Link.

Triggered Output Notes

Things to remember about Triggered Outputs are:

- Any input (Receiver, General Purpose I/O, etc.) device type that needs to trigger an output must use a Display Table that has Triggers in it.

  For example, if a comparator needs to trigger an alarm relay, you must add Triggers to its Display Table (typically the Comparator Display Table).

  If a generator device needs to trigger an alarm relay, you must add one or more Triggers to its Display Table (typically the Generator Display Table).

- Different input device types (Comparators, Generators, Microwave Alarms, etc.) can trigger the same type of Triggered Output Type (typically an Alarm Relay). They can trigger different explicit Alarm Points, but you may need only one Output Device Type. In our example above, all alarm outputs shared the same Output Device Type.
- Each input Display Table can trigger only one Output Device Type
- Multiple states in the Input Display Table can trigger the same Output Action.
  (ex: Disable and Fail on a receiver can both trigger a Set Alarm action.)
- Different states in the Input Display Table can trigger different actions in the Output Device Type.

  ex: Set Alarm, Reset Alarm in a single-bit Output Device Type
  Set Major Alarm, Set Minor Alarm, or Reset Alarms in multi-bit types.

- Even if you've set up multiple Output Actions in the Output Device Type, you don't need to use all of them in any particular input Display Table. (In our example, we defined a Reset action, but never triggered it from any of the Input Display Tables.)
- Each Input Display Table can point to only Output Device Type. If you have a multi-bit Input Display Table and you need to trigger multiple alarm relays from different states in that Display Table, you must set up a multi-bit Output Device Type to receive those triggers.
- If you need to have the same type of input trigger actions in different Output Device Types (ex: one set of comparators triggering a single-bit Output Device Type and another set of comparators triggering a multi-bit Output Device Type), you will need to set up two similar Input Display Tables (like Comparator1 and Comparator 2), each pointing to the different Output Device Types.

Appendix A: Error Logging Definitions

Logging is a feature of the MCN and the RCD Programs to assist with System Hardware Status, trouble shooting and Diagnostics. The messages to be logged are formatted for general text output. The formatting of messages to be logged to the screen, printer, file, or email is defined in a system configuration file with a name similar to:

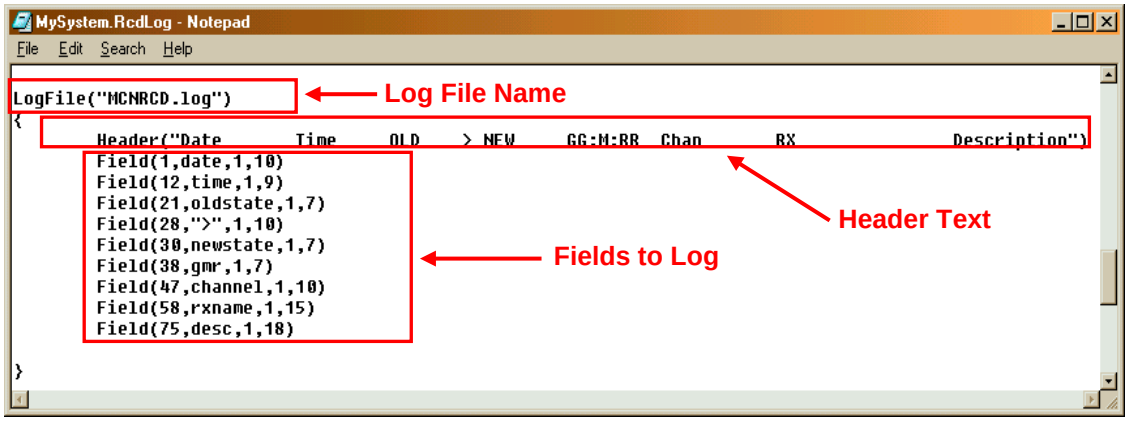
SystemName.RcdLog

where SystemName is the name you used to save your system files in MCN Config Server.

You can edit that file with a text editor to change the items that are logged .

Logging to a File

The typical logging definitions for a file are shown in the example below.



Log File Location & Size

If the LogFile parameter above does not include an explicit path reference, the log file will be stored in

C:\ProgramData\CTI Products Inc\McnRcd (for Windows 7.)

Default Log File size is 16 MB.

When a log file reaches its limits, it is re-named with an "Old" extension and a new log file is created.

If a different log file size is required, use Regedit to go to the following key in the registry (for Windows 7):

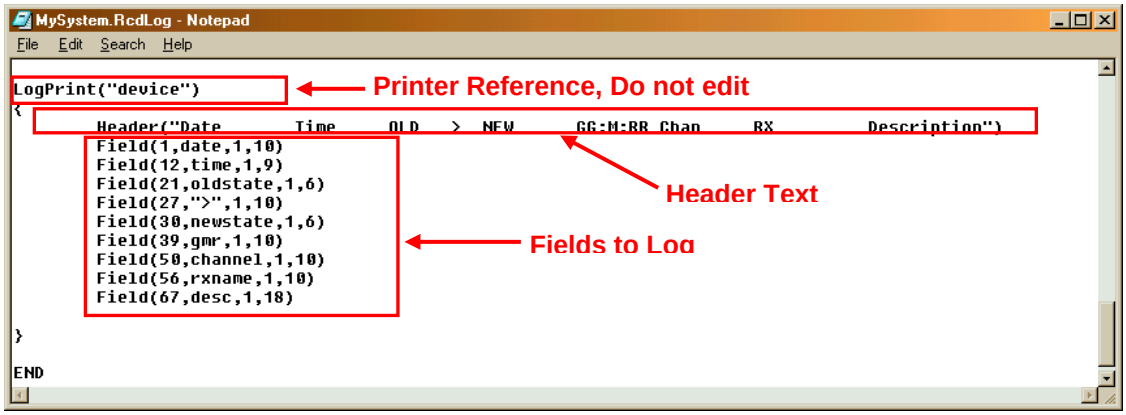
HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\CTI Products\MCNRCD\Logs

Enter the following DWord entry: MaxLogSize

Enter the value (in Decimal bytes) for the maximum log size. Restart MCN Server 8000 for the change to take effect.

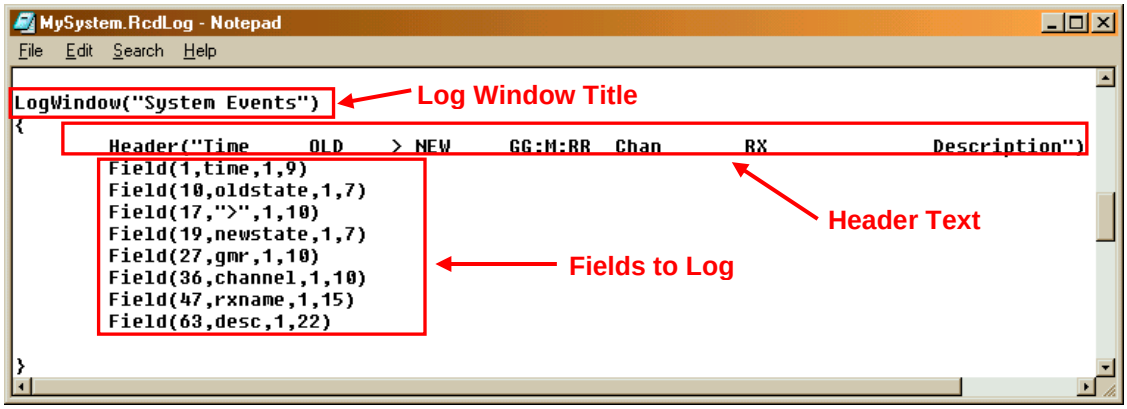
Logging to a Printer

The typical logging definitions for printing are shown in the example below.



Logging to the PC Screen

The typical logging definitions for screen are shown in the example below.



Error Logging Definition File Parameters

Email Subject Line	Not used in MCN Server 8000.
Email Recipients	Information in this section includes the "Email Groups" specified in older versions of the MCNConfig program and should not be edited. Not used in MCN Server 8000.
Log File Name	The text between quotes is the file name that will be used for logs.
Printer Device Name	The text between quotes is the default printer device name "device". This should not be edited
Log Window Title	The text between quotes on this line will appear in the title block of the displayed log window.
Header Text (column titles)	The text between quotes on this line will be the first line in the body of the email, file, printout, or screen.
Fields to Log	For each field to be logged, the following four parameters must be specified: Column for start of field Field Name, or text enclosed in quotes (see Field Name table below) Beginning character position to be printed for field Ending character position to be printed for field

Field Names

Field names are defined below.

Field Name	Description
Date	Date of state change. Format is mm-dd-yyyy
Time	Time of state change. Format is hh:mm:ss
Oldstate	State of signal prior to change
Newstate	Current state of signal
Gmr	Group, Module, Receiver address of signal. Format is gg:m:rr
Channel	Channel name
Rxname	Receiver name
Desc	Description of Receiver name
"text"	Text between quotes will be logged as written

Force Log Subsections

Each of the above sections includes a Force Log subsection as shown below:

```
LogWindow("System Events")
{
      StartDly(0)
      Header("Time     OLD    > NEW     GG:M:RR  Chan             RX              Description")
      Field(0,time,1,9)
      Field(9,oldstate,1,7)
      Field(16,">",1,10)
      Field(18,newstate,1,7)
      Field(26,gmr,1,10)
      Field(35,channel,1,16)
      Field(52,rxname,1,15)
      Field(68,desc,1,22)

      FlField(0,time,1,12)
      FlField(9,flstatus,1,30)
      FlField(26,fldesc,1,100)
```

The Force Log section is for events related to the Network Interfaces, link On-Line and Off-Line.

The Force Log Fields are:

- **flstatus** Force Log Status (Online, Offline, etc.)
- **fldesc** Force Log Description (NI information)

Appendix B: Backup & Restore Procedures

This section covers the following standard Backup & Restore operations:

- The MCN Server 8000 and MCN Client software
- The MCN Server Software Key File
- The Custom MCN Server 8000 System Configuration files
- HIB-IP settings
- MCN Server 8000 IP Configuration settings
- MCN Client IP Configuration settings.

The backup and restoration instructions for the following items are beyond the scope of this manual. The appropriate documentation should be consulted for those procedures:

- Server and Client PC Operating Systems
- Server and Client PC User Accounts
- Server and Client PC OS Hardening
- Other (non- MCN Server 8000) user files on the Server & Client PC
- IP Comparators
- IP Network infrastructure
- Legacy MCN equipment
- Other non-related hardware or software

MCN Server and Client Software Backup

1. If needed, use a commercially available method to make a backup copy of the MCN Server 8000 distribution media (up to the limit of copies allowed by the license).

   This media includes the MCN Server 8000 software, the MCN Config Server software, and the MCN Client software.

2. Store the original distribution media and the backup media in safe places.

MCN Server Software Key Backup

1. If needed, use a commercially available method to make a backup copy of the MCN Server 8000 Software Key File CD or Software Key File itself. The Key file will have the form: KF-xxxx-yyy zzzzzzzzzzzzz.MCNKey

   Where: xxxx is a number that matches the Hardware Key Serial Number
   yyy is the Key File Version number and
   zzzzzz is an optional descriptive text string.

2. Store the original distribution media and the backup media in safe places.

Custom MCN Server 8000 System Configuration Files Backup

The Custom MCN Server 8000 System Configuration Files are the files have been configured to describe your system. They include files with the following types of file names:

- *SystemName*.McnSys
- *SystemName*.RcdDtb
- *SystemName*.RcdHrd
- *SystemName*.RcdLog
- *SystemName*.RcdSec
- *SystemName*.*ScreenName1*.RcdWnd

Where:

SystemName	is the name you used when you saved your system and
ScreenName1	is the name you used for your first Display Window (Screen).

Note 1: Each system has a minimum of the above 6 file types.

Note 2: If you have more Display Windows (Screens) you will have more RcdWnd files; one for each screen

Backup Instructions

1. Use Windows Explorer to find the current set of files that you are using for your system.
2. Use Windows Explorer or a commercially available method to make a backup copy of the files. (It may be helpful to use a program to Zip them up into a single file.)
3. Store the backup copy in safe places.

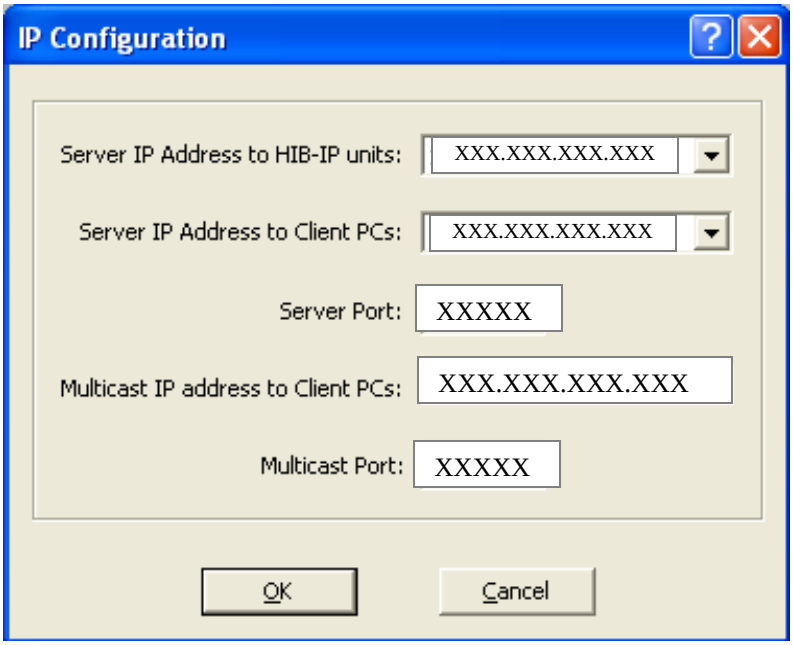
HIB-IP Settings Backup

The HIB-IP settings (if your system uses a HIB-IP unit) are stored in the Custom MCN Server 8000 System Configuration Files and will be backed up with the previous step.

MCN Server 8000 IP Configuration Backup

The IP Configuration parameters for the MCN Server 8000 software that will have to be re-entered when the system is restored. Make a backup of those values:

1. Run **MCN Server 8000**.
   From the menu, select **Options / IP Settings.**
2. The IP Configuration window will open similar to the one below:

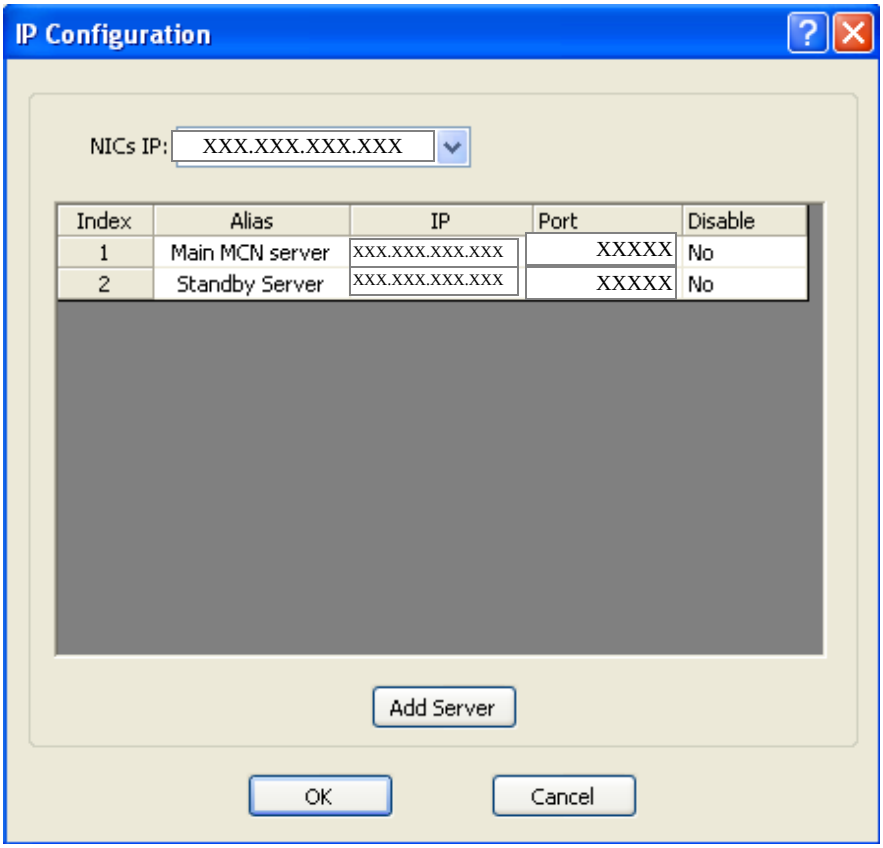


3. Make a backup copy of the information found in the IP Configuration window.
   This can be on paper, or in a text file, or possibly a screen capture of the IP Configuration window.
4. Store the backup copy in safe places.

MCN Client IP Configuration Backup

The IP Configuration parameters for the MCN Client software that will have to be re-entered when the system is restored. Make a backup of those values:

1. Run **ClientRCD**
   From the menu, select **Options / IP Settings.**
2. The IP Configuration window will open similar to the one below:



   There will be a line for each MCN Server that the Client can use.
3. Make a backup copy of the information found in the IP Configuration window.
   This can be on paper, or in a text file, or possibly a screen capture of the IP Configuration window.
4. Store the backup copy in safe places.

Restoring the MCN Server 8000 Software & IP Settings

1. Use the original or backup MCN Server 8000 software distribution media
2. Install the MCN Server 8000 software by following the step in Installing MCN Server Software section starting on page ***22*** of this manual.
3. Select the **Server** installation option
4. When prompted for the Key File, use the original or backup Key File or Key File Media.
5. When prompted to enter IP parameters, enter the parameters saved in the MCN Server 8000 IP Configuration Backup procedure.

Restoring the Custom System Configuration Files

1. Use the backup copy of the Custom MCN Server 8000 System Configuration Files
2. Using Windows Explorer, copy the backup files into a folder that has the following access levels:

	Administrator	Read & Write
	User	Read (and Write if desired)

3. If the files were previously Zipped, un-Zip them.

Restoring the HIB-IP Configuration

The Custom System Configuration Files restored above will have the configuration information for the HIB-IP unit(s) (if used). If the HIB-IP needs to be restored (for example, if the HIB-IP unit is replaced), follow this procedure:

1. Run MCN Config Server 8000 software.
2. Load the system that was restored above.
3. Program the HIB-IP Unit(s) as per the ***Programming HIB-IP and*** HIB-IP 8000 Units section on page ***86*** of this manual.

Restoring the Client Software & IP Settings

1. Use the original or backup MCN Server 8000 software distribution media
2. Install the MCN Server 8000 software by following the step in section ***Installing MCN Server Software*** starting on page ***22*** of this manual.
3. Select the **Client** installation option
4. When prompted to enter IP parameters, enter the parameters saved in the MCN Client IP Configuration Backup procedure.

Appendix C: Installing Legacy PCLTA Interface Board & Driver

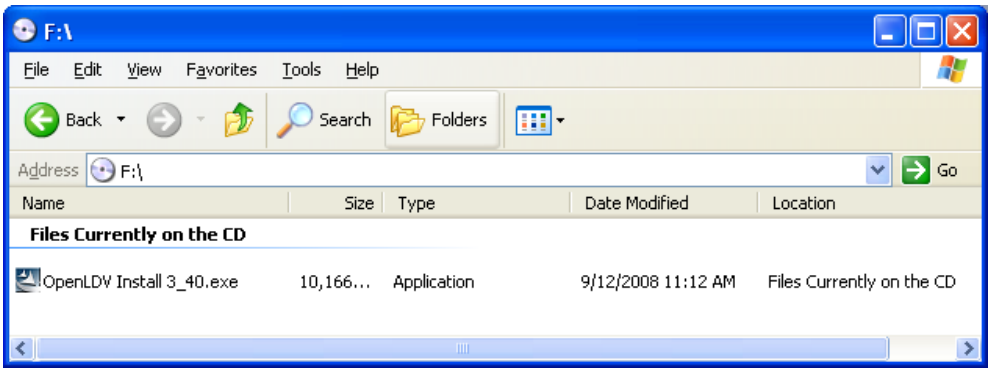
Legacy PCLTA Network Interface Installation

PCLTA Internal PCI Network Interfaces are supported only on 32-bit operating systems. Drivers for the PCLTA cards are not available for 64-bit operating systems.

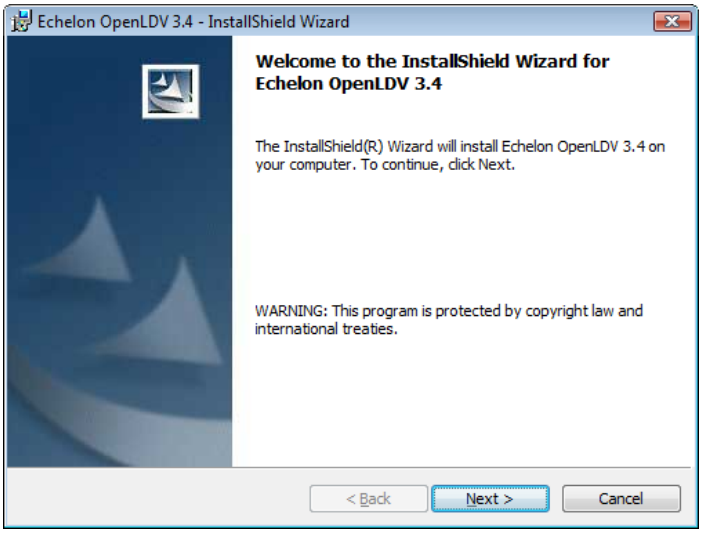
If you are not using a PCLTA card, skip this section.

Install Legacy PCLTA Device Drivers (32 bit operating systems only)

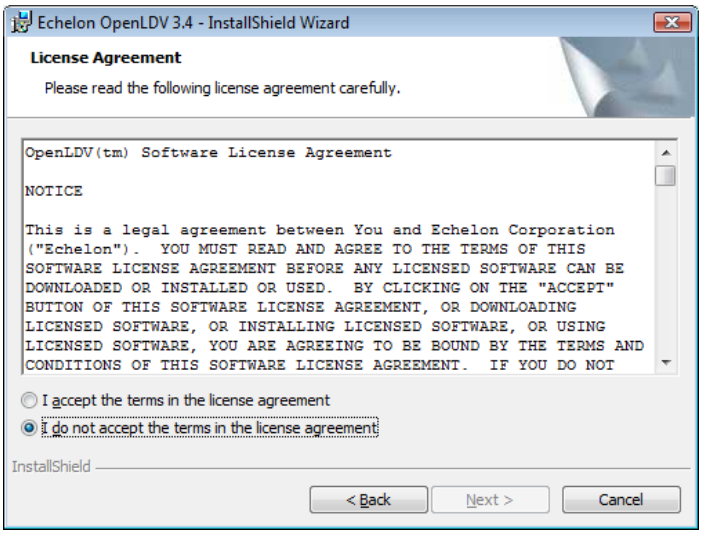
Insert the PCLTA driver CD into the CDROM drive. When the CD contents folder is displayed as shown below, double-click the ***"OpenLdv Install 3_40.exe"*** file to start the installation of the PCLTA device drivers and OpenLdv.


F:\
File Edit View Favorites Tools Help
Back Search Folders
Address F:\
Go
Name Size Type Date Modified Location
Files Currently on the CD
OpenLDV Install 3_40.exe 10,166... Application 9/12/2008 11:12 AM Files Currently on the CD

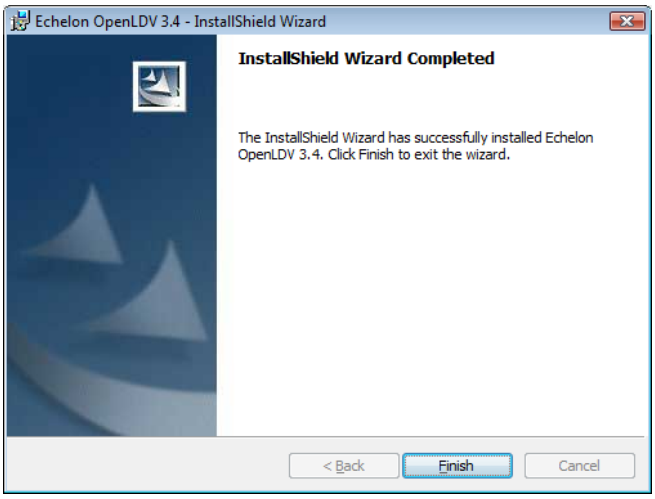
The OpenLDV Install welcome screen will be displayed as shown below. Before continuing, it is recommended that you exit all Windows programs.


Echelon OpenLDV 3.4 - InstallShield Wizard
Welcome to the InstallShield Wizard for Echelon OpenLDV 3.4
The InstallShield(R) Wizard will install Echelon OpenLDV 3.4 on your computer. To continue, click Next.
WARNING: This program is protected by copyright law and international treaties.
< Back
Next >
Cancel

Click the **Next** button to display the "Software License Agreement" window as shown below.


Echelon OpenLDV 3.4 - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
OpenLDV(tm) Software License Agreement
NOTICE
This is a legal agreement between You and Echelon Corporation ("Echelon"). YOU MUST READ AND AGREE TO THE TERMS OF THIS SOFTWARE LICENSE AGREEMENT BEFORE ANY LICENSED SOFTWARE CAN BE DOWNLOADED OR INSTALLED OR USED. BY CLICKING ON THE "ACCEPT" BUTTON OF THIS SOFTWARE LICENSE AGREEMENT, OR DOWNLOADING LICENSED SOFTWARE, OR INSTALLING LICENSED SOFTWARE, OR USING LICENSED SOFTWARE, YOU ARE AGREEING TO BE BOUND BY THE TERMS AND CONDITIONS OF THIS SOFTWARE LICENSE AGREEMENT. IF YOU DO NOT
I accept the terms in the license agreement
I do not accept the terms in the license agreement
InstallShield
< Back
Next >
Cancel

Click on **"I Accept the terms in the License agreement"** then click the NEXT button. OpenLDV and the PCLTA drivers will be installed. Once complete, the "Setup Complete" window will be displayed as shown below.


Echelon OpenLDV 3.4 - InstallShield Wizard
InstallShield Wizard Completed
The InstallShield Wizard has successfully installed Echelon OpenLDV 3.4. Click Finish to exit the wizard.
< Back
Finish
Cancel

Click the **Finish** button.

Finally, you must power down the computer before installing the PCLTA network interface card.

Install PCLTA Network Interface Card

The PCLTA device drivers must be installed prior to installing the card. If the drivers have not been installed, complete each of the previous steps for this section.

To install a PCLTA card into your PC, follow these steps:

Turn off the PC and remove the power cord.

Open the PC case and locate an empty slot.

Remove the corresponding blank panel from the rear of the PC.

Insert the PCLTA card into the slot, ensuring that the edge connectors are fully mated, and the slot in the rear panel-mounting lug of the PCLTA is aligned with the threaded hole in the PC chassis.

Replace the screw to hold the PCLTA firmly in place.

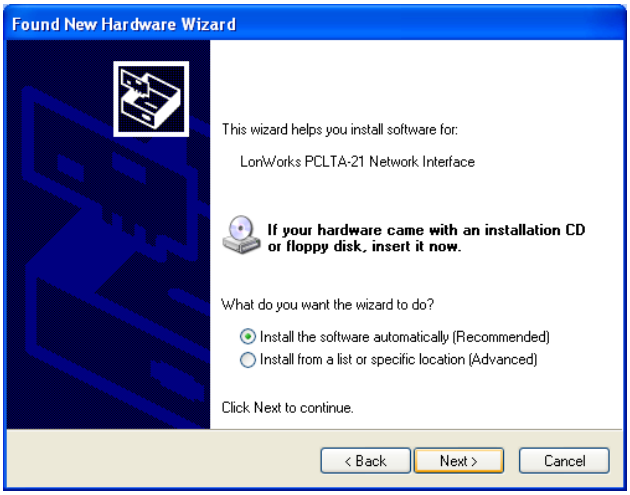
Reinsert the power cord and then restart the PC.

On power-up, Windows will automatically sense the Plug-n-Play adapter, and associate it with the drivers installed in the previous step.

If the Plug 'n Play features of the card ***failed***, the following "Found New Hardware Wizard" window may be displayed.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

Select "No, not this time", then click the **Next** button to display the following window.


Found New Hardware Wizard
This wizard helps you install software for:
LonWorks PCLTA-21 Network Interface
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

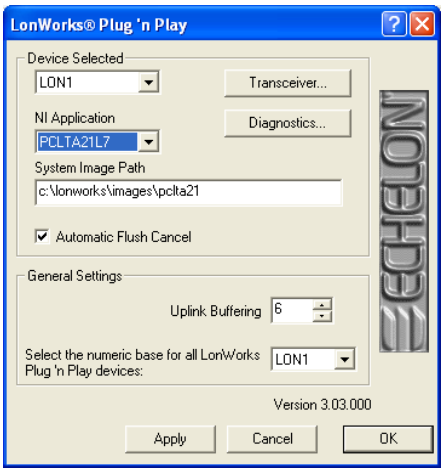
On the above window, select "Install the software automatically", and then click the **Next** button. Click the **Next** or **Finish** buttons in the remaining windows to complete the installation.

Configure and Test the PCLTA Network Interface

Configure & test the PCLTA board as shown below. ***It will not run if it is not configured.***

the From the **Start** menu button on the Windows desktop, select Control Panel from the list, and then double click the "LonWorks Plug 'n Play" icon. (If the "LonWorks Plug 'n Play" icon is not visible, change the Control Panel properties to "Classic View".)

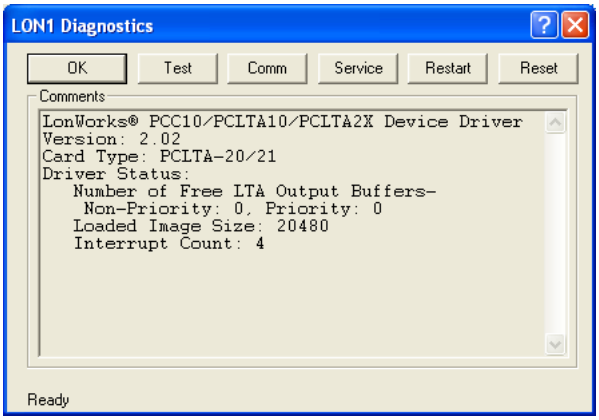
The following "LonWorks Plug 'n Play" window will be displayed.



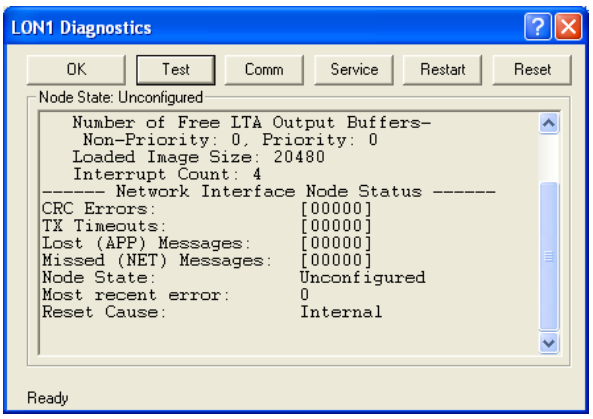
In the NI Application drop-down list, choose an image that is compatible with MCNRCD from the following table. (For all operating systems, the Image name should end with "L7".) Then click the **Apply** button.

	Windows XP, Vista, 7 (32 bit versions only)
Images Compatible with MCNRCD	PCLTA21L7
Images to Avoid	PCLTA21VNI, PCL10VNI

To check if the PCLTA network interface has been installed correctly, click the **Diagnostics** button to display the following window.



Finally, click the **Test** button to display status information similar to the following window.

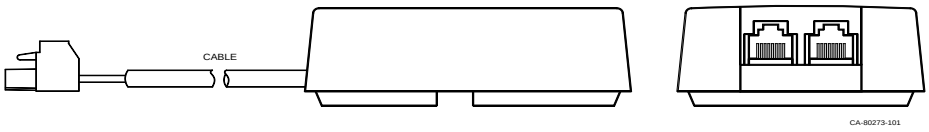


When finished, click the **OK** button on this "LON1 Diagnostics" window, and then click the **OK** button on the "LonWorks Plug 'n Play" window.

If the PCLTA network interface card was installed prior to device driver installation, the PCLTA may not function correctly. To correct this situation, see ***Appendix D: Fixing PCLTA Installation*** on page ***215***.

Cabling and Termination

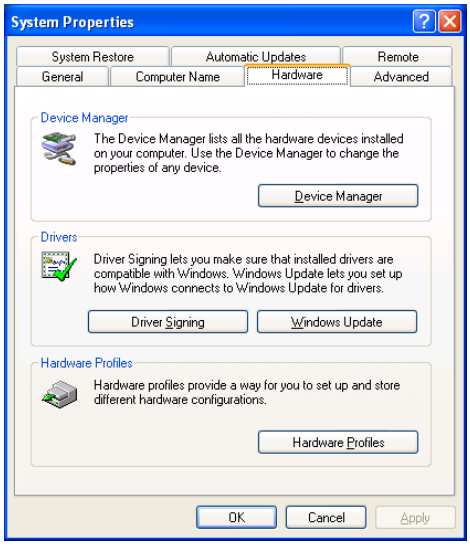
The PCLTA card is different from all other MCN modules in that it does not have an RJ-45 connector for the network cable to plug into. A 'T' Adapter (S2-60617), shown below, must be installed to connect the PCLTA's two-pin connector with the MCN network cable. Use one RJ-45 connector on this adapter for the network cable, and plug a terminator (either TP/XF1250 or TP/FT10) into the other.



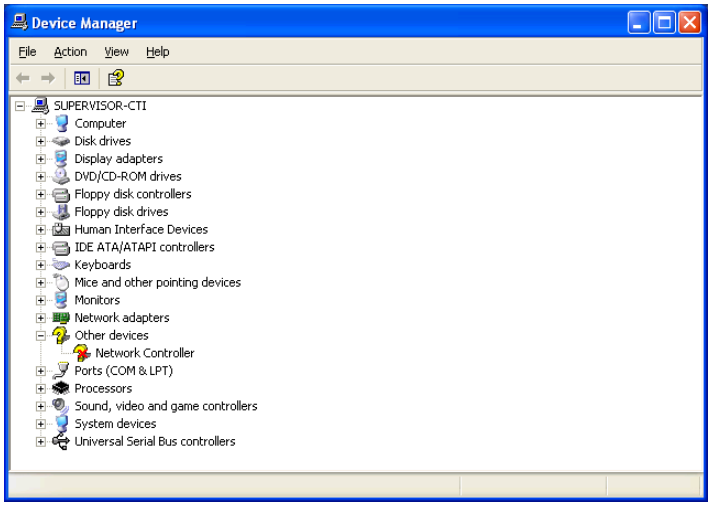
Appendix D: Fixing PCLTA Installation Problems

The PCLTA drivers must be loaded prior to installing the PCLTA card. If the PCLTA card was installed first, and an attempt was made by the Windows operating system to load the drivers, follow these steps to re-install the drivers correctly:

Navigate to the Control Panel from the **Start** Menu, then double-click the "System" icon to display the "System Properties" window as shown below. (If the "System" icon is not visible, change the Control Panel properties to "Classic View".)


System Properties
System Restore
Automatic Updates
Remote
General
Computer Name
Hardware
Advanced
Device Manager
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
Device Manager
Drivers
Driver Signing lets you make sure that installed drivers are compatible with Windows. Windows Update lets you set up how Windows connects to Windows Update for drivers.
Driver Signing
Windows Update
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles
OK
Cancel
Apply

On the "Hardware" tab, click on the **Device Manager** button to display the "Device Manager" window. If the driver for PCLTA network interface is not installed correctly, "Other Devices" will be listed (instead of "LonWorks Network Interface"). Expand the "Other Devices" icon so that "Network Controller" is listed as shown below.



Select "Network Controller" with an "X" through its icon, then from the ***Action*** Menu, select "Disable". Follow any additional prompts, and restart the PC.

The PCLTA driver can now be reinstalled from the distribution CD (S2-61502).

Appendix E: Importing a System from MCNRCD for DOS

The MCNConfig program can import the following configuration files from the older DOS version MCNRCD program:

- ****.GCF*** Group Configuration Files (Receiver Names & Notes)
- ****.MCF*** Module Configuration Files (Module Names & Status Table pointers)
- ***MCNRCD.CFG*** Custom Status Tables

This saves the majority of the work required to re-build a system for the MCN Server.

Since there is a significant difference in screen files between the two programs, the Import command will not import the *.MSF screen

files. It's easy to create the Display Window Screens. We didn't want to take all the fun out of the import process! Some of the new configuration features in the Windows program that you'll want to look at are:

Selectable numbers of Rows & Columns

Variable length Receiver Names & Descriptions

Cutting & Pasting from Excel
(especially good for receiver names and phone line / T1 Line information)

User adjustable column widths

Multi-tabbed display screens for faster switching between systems

Selectable colors for labels

Better support of alarms & general purpose I/Os

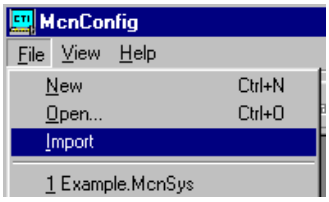
Support of more than 8 receivers in AIBs for Astrotac comparators

Channel grouping

Importing the System

Start the Config program or close the current system.

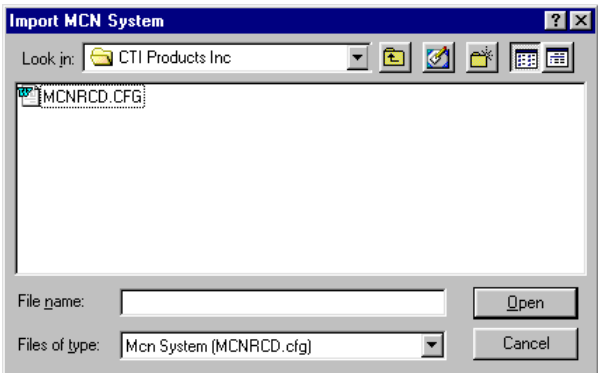
From the File Menu, select ***Import***.



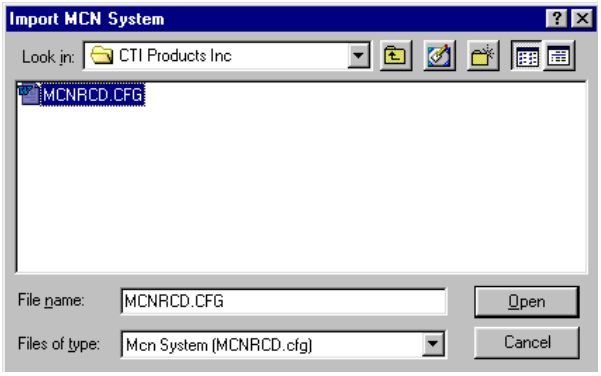
Navigate to the correct Program Directory for your DOS version of MCNRCD.
This is typically either:

```
c:\CTI\
c:\MCN\ or
c:\Program Files\CTI Products Inc\
```

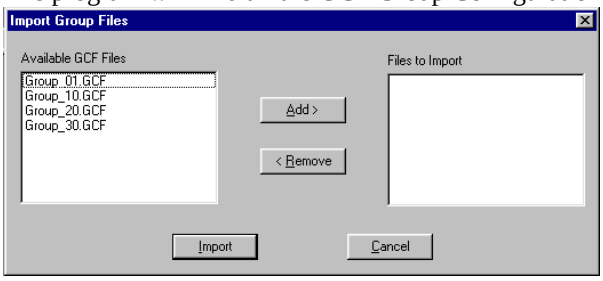
This window will display only files named ***MCNRCD.CFG*** as shown below:



Select the ***MCNRCD.CFG*** file and click the **Open** button.



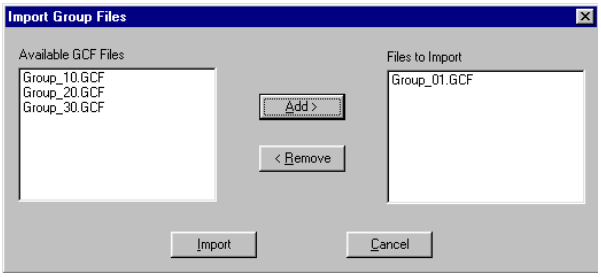
The program will find all the GCF Group Configuration files.



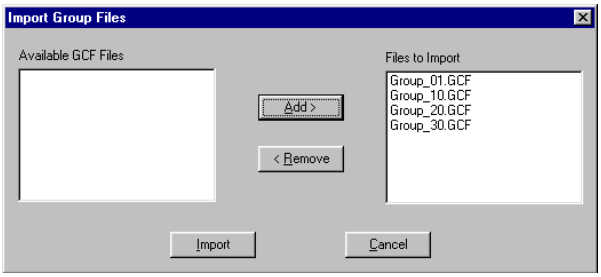
Note that there may be stray example files in the working directory, such as the MCNGRP0.GCF and MCNGRP1.GCF files that were shipped with the system.

You will want to import only the files that contain your current system data.

Select the first Group File to load and click the **Add** button.
Or, **Double Click** on an GCF File on the left side to add.



Repeat until you have added all the Group files that you want to import.



Click the **Import** button.
The program will build a Hardware Window and a Receivers Window.

Saving Imported Systems

Save Now or Save Later?

The import function will convert any special Display Table (Custom Status) information and colors from your old DOS system.

The DOS program used a blue background, whereas the Windows program uses a White background.
The MCNConfig program gives you the ability to use either the imported Display Table information or the Default Windows Display Table information.

If you DO NOT nave custom status table data in the MCNRCD.CFG file:
You will probably want to use the new Default Windows Display Table.

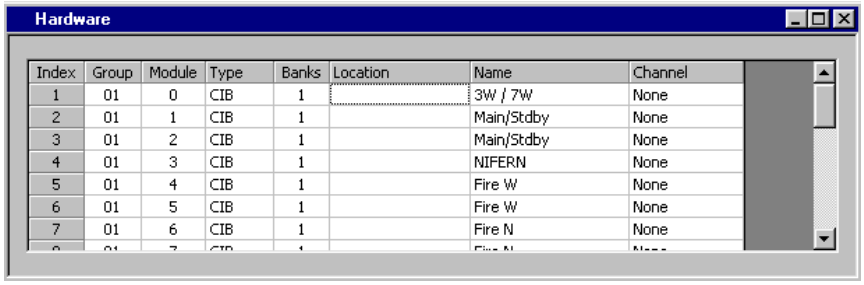
1. Save the system now (before you make a Display Window).
2. Close the system.
3. Re-open the system. The program will use the default Display Table.
4. Build your Display Windows.
5. Re-save the system.

If you DO HAVE custom status table data in the MCNRCD.CFG file:
You will probably want to use the converted Display Table.

1. Build a Display Window before you save the system
2. The system will use the converted Custom Status information.
3. Save the System
4. If you want to change the status colors (this can be done later),
   - Save the system
   - View the Display Table Window.
   - Edit the appropriate Display Table entries.

Imported Hardware Window

The program gets the Hardware information from the .GCF and .MCF files.



Index	Group	Module	Type	Banks	Location	Name	Channel
1	01	0	CIB	1		3W / 7W	None
2	01	1	CIB	1		Main/Stdby	None
3	01	2	CIB	1		Main/Stdby	None
4	01	3	CIB	1		NIFERN	None
5	01	4	CIB	1		Fire W	None
6	01	5	CIB	1		Fire W	None
7	01	6	CIB	1		Fire N	None

Type — All modules are imported as CIBs.
Change as required if the old modules are AIBs or IOBs. If you have IOBs, select IOB STD, since this was the only IOB supported in the old program.

Banks — The DOS version of the program supported only 1 bank. For AIB modules, if you upgrade the Astrotac comparator to more than 8 receivers, change this field.

Location — There was no Location field in the old program. Add a location description if desired.

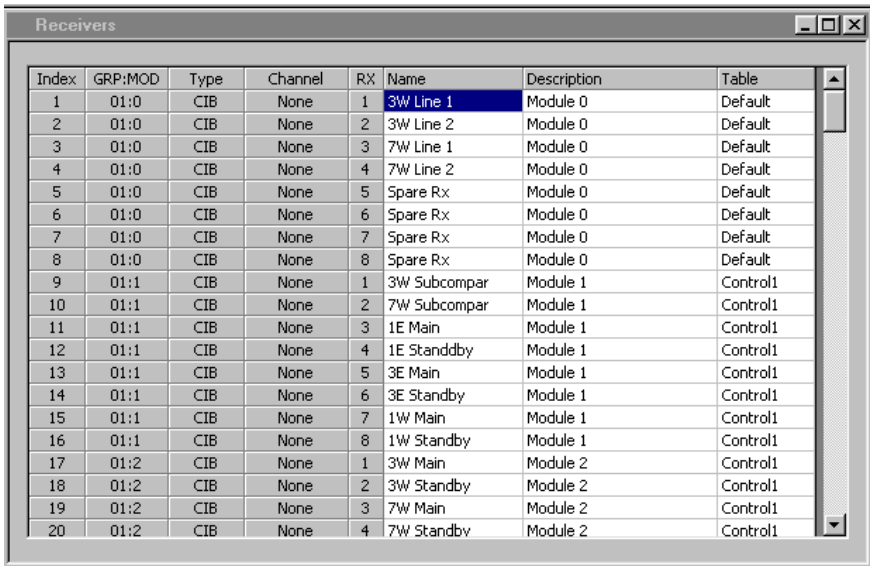
Name — The module Name was part of the ***xxx.MCF*** file. You probably won't see a name unless you have hand-edited that file. Enter a name for this module if you desire.

Channel — The DOS program did not support an explicit Channel field. Many people put Channel information in the Receiver Description field in the DOS version.

-Open the Channel Window and add channels as appropriate.
-Select the appropriate channel for each module.

Imported Receivers Window

The program gets the Receivers information from the .GCF and .MCF files.



Index	GRP:MOD	Type	Channel	RX	Name	Description	Table
1	01:0	CIB	None	1	3W Line 1	Module 0	Default
2	01:0	CIB	None	2	3W Line 2	Module 0	Default
3	01:0	CIB	None	3	7W Line 1	Module 0	Default
4	01:0	CIB	None	4	7W Line 2	Module 0	Default
5	01:0	CIB	None	5	Spare Rx	Module 0	Default
6	01:0	CIB	None	6	Spare Rx	Module 0	Default
7	01:0	CIB	None	7	Spare Rx	Module 0	Default
8	01:0	CIB	None	8	Spare Rx	Module 0	Default
9	01:1	CIB	None	1	3W Subcompar	Module 1	Control1
10	01:1	CIB	None	2	7W Subcompar	Module 1	Control1
11	01:1	CIB	None	3	1E Main	Module 1	Control1
12	01:1	CIB	None	4	1E Standdby	Module 1	Control1
13	01:1	CIB	None	5	3E Main	Module 1	Control1
14	01:1	CIB	None	6	3E Standby	Module 1	Control1
15	01:1	CIB	None	7	1W Main	Module 1	Control1
16	01:1	CIB	None	8	1W Standby	Module 1	Control1
17	01:2	CIB	None	1	3W Main	Module 2	Control1
18	01:2	CIB	None	2	3W Standby	Module 2	Control1
19	01:2	CIB	None	3	7W Main	Module 2	Control1
20	01:2	CIB	None	4	7W Standby	Module 2	Control1

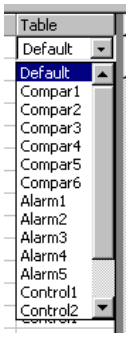
Name — This is taken from the *Receiver Name* from the ***.GCF*** file.

Description — This is taken from the *Corresponding Channel Name / Notes* field in the ***.GCF*** file.

Table — This is the Status Table used by the old DOS program. It is based on the entry in the ***.MCF*** file. In the DOS program, Status Tables were assigned on a module (CIB, IOB, etc.) basis. In the new Windows program, the Status Tables are assigned per receiver (or I/O Block).

Imported Status Tables

The program gets the Status Tables from the ***MCNRCD.CFG*** file. Normally, you will just have the Default entry. If you have a specially modified ***MCNRCD.CFG*** file, you may see additional entries in the Status Table drop-down list in the Receivers Window.



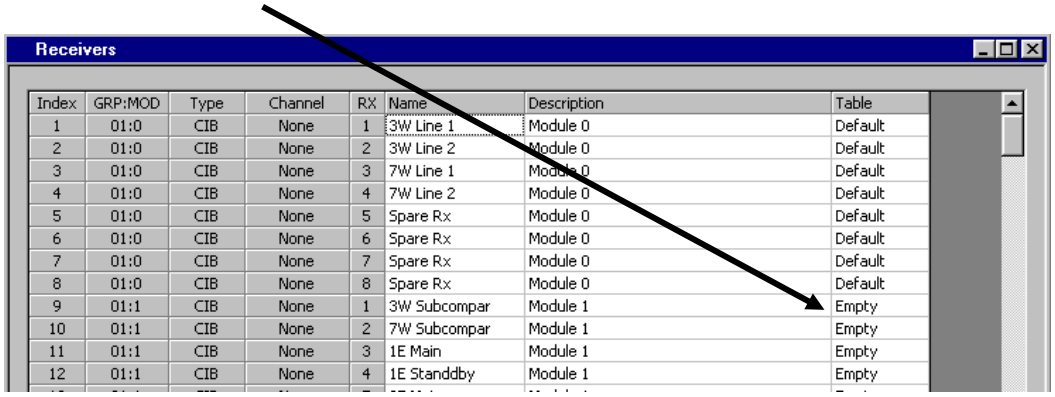
The above example is from a customer who uses a lot of alarms & controls in his system.
He has 17 custom Status Tables! (Thanks, John!)

Missing MCF Files

If there is no MCF file to match a GCF file, the program sets the Status Table to the first Status Table in the ***MCNRCD.CFG*** file (typically "Default"). This matches how the MCNRCD for DOS program handles a missing MCF file.

Empty Status Table Entries

If the .MCF file points to a non-existent Status Table in ***MCNRCD.CFG***, the Table entry will be "Empty" as shown below.



Index	GRP:MOD	Type	Channel	RX	Name	Description	Table
1	01:0	CIB	None	1	3W Line 1	Module 0	Default
2	01:0	CIB	None	2	3W Line 2	Module 0	Default
3	01:0	CIB	None	3	7W Line 1	Module 0	Default
4	01:0	CIB	None	4	7W Line 2	Module 0	Default
5	01:0	CIB	None	5	Spare Rx	Module 0	Default
6	01:0	CIB	None	6	Spare Rx	Module 0	Default
7	01:0	CIB	None	7	Spare Rx	Module 0	Default
8	01:0	CIB	None	8	Spare Rx	Module 0	Default
9	01:1	CIB	None	1	3W Subcompar	Module 1	Empty
10	01:1	CIB	None	2	7W Subcompar	Module 1	Empty
11	01:1	CIB	None	3	1E Main	Module 1	Empty
12	01:1	CIB	None	4	1E Standdby	Module 1	Empty

This will normally not occur, since the DOS version of MCNRCD will exit if it sees this condition.

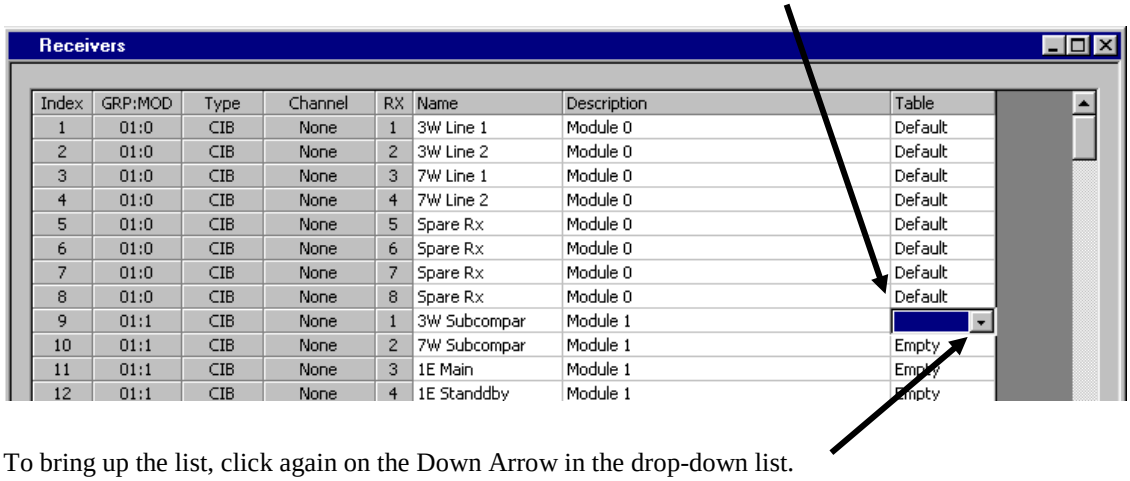
If you see "Empty" in the Table column, it usually means:

- You have imported a GCF file that is not normally used in your system
- You have modified the MCF or ***MCNRCD.CFG*** file so that the Status Tables (custom categories) don't match.

To correct the "Empty" problem, either:

- Close the current system and re-import without the extra GCF file or
- Modify the MCF or MCNRCD file so that all the Status Table entries are valid or
- For the receivers showing "Empty", select an appropriate Status Table from the drop-down list. (To speed this up, after you have changed a few entries, use the Copy & Paste commands to copy a range of entries.)

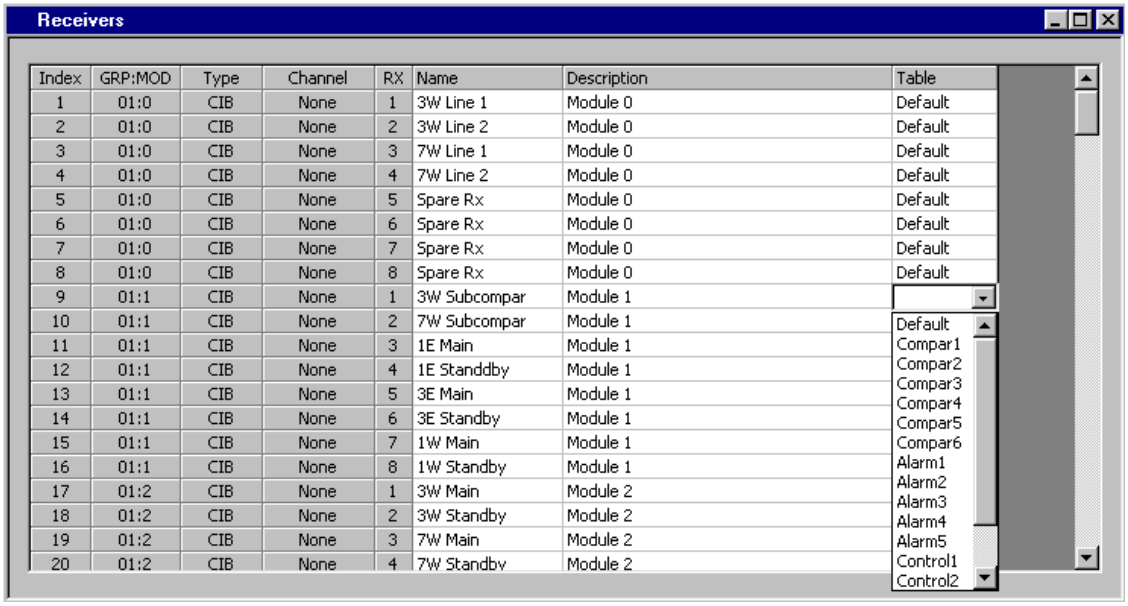
When there is an "Empty" entry, the drop-down list will initially show a blank.



Index	GRP:MOD	Type	Channel	RX	Name	Description	Table
1	01:0	CIB	None	1	3W Line 1	Module 0	Default
2	01:0	CIB	None	2	3W Line 2	Module 0	Default
3	01:0	CIB	None	3	7W Line 1	Module 0	Default
4	01:0	CIB	None	4	7W Line 2	Module 0	Default
5	01:0	CIB	None	5	Spare Rx	Module 0	Default
6	01:0	CIB	None	6	Spare Rx	Module 0	Default
7	01:0	CIB	None	7	Spare Rx	Module 0	Default
8	01:0	CIB	None	8	Spare Rx	Module 0	Default
9	01:1	CIB	None	1	3W Subcompar	Module 1	
10	01:1	CIB	None	2	7W Subcompar	Module 1	Empty
11	01:1	CIB	None	3	1E Main	Module 1	Empty
12	01:1	CIB	None	4	1E Standdby	Module 1	Empty

To bring up the list, click again on the Down Arrow in the drop-down list.

This will bring up the full list of available Status Tables.


Receivers
Index GRP:MOD Type Channel RX Name Description Table
1 01:0 CIB None 1 3W Line 1 Module 0 Default
2 01:0 CIB None 2 3W Line 2 Module 0 Default
3 01:0 CIB None 3 7W Line 1 Module 0 Default
4 01:0 CIB None 4 7W Line 2 Module 0 Default
5 01:0 CIB None 5 Spare Rx Module 0 Default
6 01:0 CIB None 6 Spare Rx Module 0 Default
7 01:0 CIB None 7 Spare Rx Module 0 Default
8 01:0 CIB None 8 Spare Rx Module 0 Default
9 01:1 CIB None 1 3W Subcompar Module 1
10 01:1 CIB None 2 7W Subcompar Module 1
11 01:1 CIB None 3 1E Main Module 1
12 01:1 CIB None 4 1E Standdby Module 1
13 01:1 CIB None 5 3E Main Module 1
14 01:1 CIB None 6 3E Standby Module 1
15 01:1 CIB None 7 1W Main Module 1
16 01:1 CIB None 8 1W Standby Module 1
17 01:2 CIB None 1 3W Main Module 2
18 01:2 CIB None 2 3W Standby Module 2
19 01:2 CIB None 3 7W Main Module 2
20 01:2 CIB None 4 7W Standby Module 2
Default
Compar1
Compar2
Compar3
Compar4
Compar5
Compar6
Alarm1
Alarm2
Alarm3
Alarm4
Alarm5
Control1
Control2

Finishing up the Import

After you have imported data and cleaned up various fields as described above, you'll need to do the following:

Save the data (File Save)

Add new Display Window

Place Receivers & Labels in Display Window

Add Tabs in the Display Window if desired

Save the data (File Save)

Set up Sound Files if desired

The MCN Server program plays .WAV files for alarms. Various alarm sounds are included in the \sounds directory under the working directory (typically c:\Program Files\CTI Products Inc\McnRcd\sounds). The Import function will not convert the alert tones from your ***MCNRCD.CFG*** file. (See ***Editing the fields*** on page ***157*** for details on editing the sounds to play for alarm conditions.)

Display Window differences between the DOS and Windows programs

Display Grid

The old MCNRCD for DOS program used a fixed grid of 22 rows x 4 columns.

The new MCN Server program has user-settable grid size.

You can now fit more receivers in one Display Window.

Alternately, you can make the Display Window smaller if you wish.

Tabs vs. Screens

To see a new screen in the old program, you would load a new screen file.

The Display Window in the new program lets you switch between "screens" quicker.

In the new Config program you can also create multiple Display Windows for use by different users.

For Technicians, build all your desired screens as tabs in one Display Window.

For Dispatchers, build Display Windows with tabs as required depending on which channels they need to see. You can build different Display Windows for different dispatchers.

Appendix F: Legacy Equipment Part Numbers

MOTOROLA PART#	CTI Products PART#	Description
		MCN Server 8000 Legacy Comparator & I/O Support
DQS261151	S2-61151	HIB-IP 8000 Unit To connect to legacy MCN networks and GPIO modules *Release to coincide with Astro™25 7.13 release*
		Comparator Interface Modules
CDN6119A		AIB-ASTRO-TAC Interface Module
CDN6121A	S2-60442	CIB Comparator Interface Module
		General Purpose I/O Modules
DQS261281	S2-61281	MCN GPI-12 Input Module 12 Opto Inputs
DQS261282	S2-61282	MCN GPI-24 Input Module 24 Opto Inputs
	S2-61283	MCN GPO-12A Output Module 12 SSR Outputs (Form A)
DQS261284	S2-61284	MCN GPO-24A Output Module 24 SSR Outputs (Form A)
DQS261285	S2-61285	MCN GPIO-1212A Input / Output Module 12 Opto Inputs, 12 SSR Outputs (Form A)
DSS261299	S2-61299	MCN GPIO-1208C Input / Output Module 12 Opto Inputs, 8 Mech Relay Outputs (Form C)
	S2-61363	MCN GPO-16C Output Module 16 Mech Relay Outputs (Form C)
	S2-61426	MCN GPIO-1208L Input / Output Module 12 Opto Inputs, 8 Magnetically Latched Mech Relay Outputs (Form C)
DQS261418	S2-61418	MCN GPIO-1212-CVT Converter Module 12 Opto Inputs, 12 SSR Outputs (Form A)
		Network Extenders and Routers
DQS160655	S1-60655	MCN EXB-232 System Extender, 78K Requires Async Serial Channel *(For use with Digital Channel Banks)*
DQS160656	S1-60656	MCN EXB-232 System Extender, 1250K Requires Async Serial Channel *(For use with Digital Channel Banks)*
DQS160962	S1-60962	MCN EXB-IP System Extender, 78K (For 10Base-T Ethernet)
DQS160963	S1-60963	MCN EXB-IP System Extender,1250K (For 10Base-T Ethernet)
DQS260825	S2-60825	Custom System Configuration / Test *(Required for each EXB or Router Module)*
		Mounting
CDN6112A	S2-60435	Rack Mount Quad Size A
DQS260443	S2-60443	Triple Rack Mount (2) Size A, (1) Size B

MOTOROLA PART#	CTI Products PART#	Description
DQS260472	S2-60472	Triple Rack Mount (3) Size B
CDN6114A	S2-60437	Mounting Bracket CIB-DIGITAC
		NETWORK CABLES:
CDN6123A	S2-60438	Cable Assy Network 9”
CDN6124A	89-10732	Cable Assy Network 3’
CDN6125A	89-10712	Cable Assy Network 10’
CDN6126A	89-10835	Cable Assy Network 25’
		25-Pair I/O Cables & Punch Blocks:
CDN6130A	89-10837	Cable Assy 25 Pr Male-Male 25’
CDN6135A	89-10843	Cable Assy 25 Pr Male-Blunt 25’
CDN6118A	31-10354	Punch Block Dual / 25 PR
		Serial Cables:
CDN6131A	S2-60440	Cable Assy AIB-Comparator 10’
CDN6132A	S2-60441	Cable Kit HIB-232->PC AT/XT 6’
CDN6149A	S2-60445	Cable Assy HIB-232 ->Modem 3’
DQS260450	S2-60450	Cable Kit PC-> Modem or EXB-Ser to Modem 6'
		Power Supplies & Cables
CDN6116A	81-12112	Power Supply MCN 120VAC US/CAN
CDN6117A	81-10728	Power Supply MCN 230VAC Europe
DQ8910917	89-10917	Power Cable MCN DC 6' Must be externally fused at 1A.
		MISC:
CDN6115A	S2-60318	Network terminator (Standard 78K Systems)
DQS261088	S2-61088	Terminator Assy 1250K RJ Block
DQS260605	S2-60605	Terminator Assy 1250K RJ Block with 1' cable for PCLTA
DQS260617	S2-60617	WON NCB Adaptor WD (PCLTA) to Dual RJ
DQS160601	S1-60601	CIB-T CIB Test Board
		USER GUIDES:
CDN6134A	S2-60425	MCN System Manual
CDN6107A	S2-60399	AIB Hardware Guide
CDN6109A	S2-60426	CIB Hardware Guide
DQS261286	S2-61286	GPIO Hardware Guide
	S2-61469	GPIO-CVT Manual
CDN6110A	S2-60427	HIB-232 Hardware Guide
DQS261173	S2-61173	HIB-IP User Manual
DQS260596	S2-60596	EXB-IM & EXB-232 Hardware Guide
DQS261089	S2-61089	EXB (IP & FI) Hardware Guide

Glossary

1250	Legacy MCN 1.25mbps high speed backbone Network Rate
78K	Legacy MCN 78kbps standard network rate for CIB, HIB, AIB, IIB, and IOB modules.
AGU	MLC 8000 Subsite Link Converter Includes 4 ports for connection to the BR (Base Radios) Used in MLC 8000 Analog Comparators.
AIB	ASTRO-TAC™ Comparator Interface Module connects a Motorola ASTRO-TAC™ comparator to the MCN Network. It extends the comparator lights and switches over the network to a remote display position (either a PC or console display).
BR	Base Radio – May be a Transmit/Receive unit or just a Receiver.
CEN	Customer Enterprise Network, separated from the Radio Network Infrastructure (RNI) by routers and/or firewalls.
CIB	Legacy Comparator Interface Module connects a voting system comparator to the MCN Network. It extends the comparator lights and switches over the network to a remote display position (either a PC or console display).
CSS	Configuration / Service Software – Used for the GCM 8000 comparator and Base Radios
CT	Configuration Tool – Software used to configure the MLC 8000 Analog Comparator
CTI	Shorthand for our full company name, "CTI Products, Inc."
DA	Dispatch Application furnished with the MLC 8000 Analog Comparator CT software. This allows limited status monitoring of receivers.
EXB	Legacy System Extender Module is used in pairs to connect two MCN networks together or the extend the length of an MCN network beyond 4000 feet. Allows control and monitoring of multiple remote comparators from a central site.
EXB-232	Legacy System Extender Module with **RS-232** Asynchronous Serial Interfaces Connects remote sites using Asynchronous Serial channels (typically Subrate cards over T1 channel banks)
EXB-IM	Legacy System Extender Module with an **Internal Modem** Connects remote sites over 2-Wire or 4-Wire audio circuits.
EXB-IP	Legacy System Extender Module with an Ethernet **IP** interface Connects remote sites over IP networks.
GCM	Shorthand for GCM 8000
GCM 8000	Motorola Solutions IP Comparator for Digital radio systems
GPW 8000	Motorola Solutions Satellite Receiver
Group	Used in Legacy systems. Equivalent to the Subnet portion of the network address, less one. Valid values are from 00 to FE (hexadecimal).
GTR 8000	Motorola Solutions Base Radio
HIB-232	Legacy Host Computer Interface Module connects a PC to the MCN Network over an RS-232 connection. It can be local to the PC or connected through leased-line modems or an equivalent full-time RS-232 channel.

HIB-IP Legacy Host Computer Interface Module connects a PC to the MCN Network over an IP network.

IIB Legacy Input/Output Interface Module connects a parallel operator display device (such as a console) to the MCN Network. Can be used with AIB ASTRO-TAC™ Comparator Interface Modules to provide voting status indications (Vote, Receive, Disable, and Fail) to a console. Also can be used with CIB Comparator Interface Modules to extend the comparator display and control for other comparators over a long distance.

IOB Legacy Input/Output Control Module connects I/O devices such as relays to the MCN Network. Used with a HIB to create an I/O control system.

IP Internet Protocol

IP Address Any node connected to an IP (Internet Protocol) network must be identified with a unique 32-bit address. These 32-bit addresses are commonly written *in dotted decimal* notation as four decimal numbers (referred to as octets because each decimal number represents 8 bits) separated by decimal points. Each octet can be a number from 1 to 255. For example, 131.9.1.2 is a valid IP address.

IP Subnet A portion of an IP network that encompasses a specific range of IP addresses (ex: from 10.1.1.0 to 10.1.1.255). All IP devices on the same subnet talk to each other directly (or through hubs or switches). They do not need a router between them. (See also Subnet Mask.)

MCN Monitoring and Control Network

Mixed Mode System operation with both digital and analog radio channels.
Mixed Mode Voter Solutions include a GCM 8000 Digital Comparator and an MLC 8000 Analog Comparator.

MLC Shorthand for MLC 8000 Analog Comparator

MLC 8000 Motorola Solutions IP Comparator for Analog radio systems
Each MLC 8000 Analog Comparator is made up of one MLC 8000 Analog Comparator (VGU) and one or more MLC 8000 Subsite Link Converter (AGU)s.

MLC ID See Radio ID

MM Shorthand for Mixed Mode

Module (generic) A Legacy Input/Output device (CIB, AIB, GPIO Module) or an IP comparator.

Module (MCN Address): In MCN Addressing, the **Module number** is part of the MCN address (Group & Module numbers) used to identify an MCN legacy device. Each legacy MCN device will have both a Group and Module address. Valid values are from 00 to 7E (hexadecimal) for MCN I/O devices. For legacy MCN devices with rotary switches for the MCN addresses, the Module address will be a single hex digit from 0 to F.

Multicast An IP protocol that sends a single IP packet to a number of IP units at the same time. All receiving devices must be members of a Class D IP Multicast Group (224.x.x.x – 239.x.x.x) IP Multicast protocol is used between the MCN Server and the Clients.

MSI Motorola Solutions, Inc.

NIC Network Interface Card – Interface card between the PC and the Ethernet network.

PCLTA Legacy Internal MCN Network Interface for PC

Port (AGU) Receiver Port Number (1-4) in a particular MLC 8000 Subsite Link Converter (AGU)

Port (GCM)	Receiver Port Number (1-64) in a GCM-8000 comparator
Port (IP)	A number indicating a logical connection within an IP device. Ports allow multiple types of messages (email, HTTP, FTP, etc.) to be sent to the same IP address. The IP device routes each incoming message based upon its destination port.
Radio ID	Unique ID number in a MLC 8000 Analog Comparator and MMC comparator to identify the Receiver in a particular channel. Each MLC 8000 Subsite Link Converter (AGU) will have 4 Radio IDs in it. This ID is needed when configuring the receivers for the MLC 8000 Analog Comparator or the MMC in MCN Config Server. The Radio ID is entered in the MLC ID field in the Receiver Window.
RCD	Remote Comparator Display
RNI	Radio Network Infrastructure – the Motorola Solutions Inc (MSI) network that includes the radio and console equipment. This is separated from the Customer Enterprise Network (CEN) by routers and/or firewalls.
Subnet Mask	The bits that define the Subnet range. A portion of the IP Address Bits (normally the upper bits) are used to define the subnet range. The subnet mask identifies the "NetID" and "HostID" portions of the IP address in a bitwise fashion. The mask is constructed by placing a "1" in any bit that is part of a subnet (NetID) address. So subnet mask bits that are SET define the NetID, and CLEARED subnet mask bits define the HostID. A subnet mask of 255.255.255.0 defines the NetID as the first three octets, and the HostID as the last octet. For example, for the address 192.47.73.111 and the subnet mask of 255.255.255.0, the subnet can be identified as 192.47.73.0.
UDP	User Datagram Protocol a simple transport protocol used on the Internet.
VGU	MLC 8000 Analog Comparator Includes port for connection to the console
Voter ID	Unique ID number in a MLC 8000 Analog Comparator and MMC comparator to identify the Voter portion of the system for a particular channel. This ID is needed when configuring the MLC 8000 Analog Comparator or the MMC in MCN Config Server.

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